

# 1. Wire Rope & Strand

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- 1.1 BRIDON HIGH PERFORMANCE CRANE &  
UG MINING WIRE ROPES
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## 1.1 Bridon High Performance Crane & UG Mining Wire Ropes



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## Bridon Dyform 34LR/PI

Best combination of strength, rotation resistance, crush resistance and bend fatigue in the rotation resistant product range

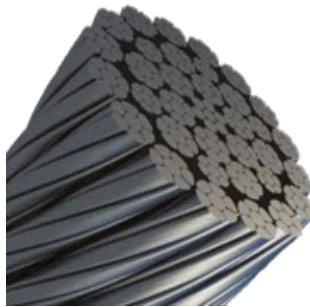
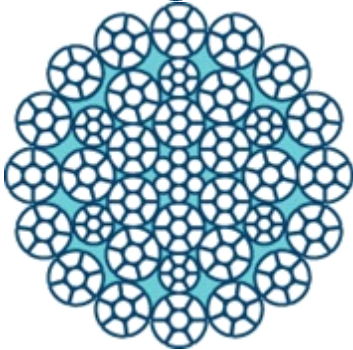
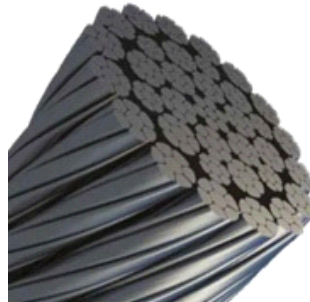
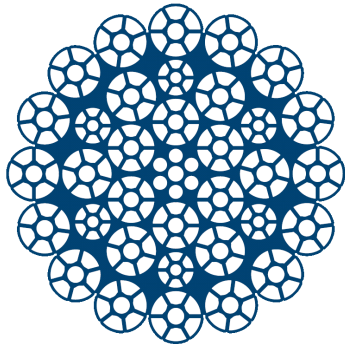
Strongest of all ropes in the rotation resistant product range

Greatest resistance to rotation of all ropes in the rotation resistant product range

Superior bending fatigue life when compared with conventional rotation resistant ropes - confirmed by laboratory testing and extensive field experience

Excellent resistance to crushing and abrasion resulting from the overall compactness and robustness of the rope and the Dyform strands - recommended when multi-layer spooling is involved

Reduced elongation results from increased steel content and the Dyform process



# product table.

<b>BRIDON</b>				<b>Dyform 34LR / PI</b>					
Diameter		Nominal length mass		Minimum Breaking Force					
				EIP/1960			EEIP/2160		
mm	inch	kg/m	lb/ft	kN	Tons (short)	Tonnes (metric)	kN	Tons (short)	Tonnes (metric)
	3/8	0.454	0.305	82	9.2	8.36	86	9.7	8.77
10.0		0.500	0.336	90.8	10.2	9.25	95.3	10.7	9.71
11.0		0.610	0.410	109	12.3	11.1	115	12.9	11.7
	7/16	0.610	0.410	111	12.5	11.3	117	13.2	11.9
12.0		0.720	0.484	130	14.6	13.2	137	15.4	13.9
	1/2	0.808	0.543	146	16.4	14.8	153	17.2	15.6
13.0		0.850	0.571	153	17.2	15.6	161	18.1	16.4
14.0		0.980	0.659	179	20.1	18.2	191	21.5	19.5
	9/16	1.02	0.687	185	20.8	18.8	201	22.6	20.5
15.0		1.13	0.759	204	22.9	20.8	214	24.1	21.8
	5/8	1.28	0.860	232	26.1	23.6	251	28.2	25.6
16.0		1.28	0.860	232	26.1	23.6	251	28.2	25.6
17.0		1.45	0.974	262	29.4	26.7	275	30.9	28
18.0		1.62	1.09	298	33.5	30.4	319	35.9	32.5
19.0		1.81	1.22	331	37.2	33.7	356	40.0	36.3
	3/4	1.81	1.22	331	37.2	33.7	356	40.0	36.3
20.0		2.00	1.34	370	41.6	37.7	397	44.6	40.5
21.0		2.21	1.49	400	45.0	40.7	420	47.2	42.8
22.0		2.42	1.63	442	49.7	45.1	482	54.2	49.1
	7/8	2.42	1.63	448	50.4	45.7	487	54.7	49.6
23.0		2.65	1.78	480	54.0	48.9	504	56.7	51.3
24.0		2.88	1.94	528	59.3	53.8	569	64.0	58.0
25.0		3.13	2.10	568	63.8	57.9	595	66.9	60.6
	1	3.23	2.17	586	65.9	59.7	623	70.0	63.5
26.0		3.38	2.27	618	69.5	63.0	660	74.2	67.3
27.0		3.65	2.45	662	74.4	67.5	694	78.0	70.7
28.0		3.92	2.63	712	80.0	72.6	758	85.2	77.3
	1 1/8	4.09	2.75	743	83.5	75.7	779	87.6	79.4
29.0		4.21	2.83	764	85.9	77.9	801	90.0	81.6
30.0		4.50	3.02	823	92.5	83.9	857	96.3	87.3
	1 1/4	5.12	3.44	919	103.3	93.7	1008	113.3	102.8
32.0		5.12	3.44	919	103.3	93.7	1008	113.3	102.8
34.0		5.87	3.94	1050	118.0	107	1151	129.4	117.3
	1 3/8	6.18	4.15	1100	123.6	112	1214	136.5	123.8
35.0		6.22	4.18	1110	124.8	113	1214	136.5	123.8
36.0		6.58	4.42	1170	131.5	119	1287	144.7	131.2
38.0		7.33	4.93	1310	147.2	133	1444	162.3	147.2
	1 1/2	7.36	4.95	1310	147.2	133	1444	162.3	147.2
40.0		8.12	5.46	1450	163.0	147	1590	178.7	162.1
	1 5/8	8.66	5.82	1550	174.2	158	1695	190.5	172.8
42.0		8.95	6.01	1600	179.8	163	1758	197.6	179.2
44.0		9.83	6.61	1750	196.7	178	1925	216.4	196.2
46.0		10.7	7.19	1920	215.8	195			
	1 7/8	11.5	7.73	2050	230.4	209			
48.0		11.7	7.86	2090	234.9	213			
50.0		12.7	8.53	2270	255.2	231			
50.8	2	13.1	8.80	2340	263.0	238			

This table is for guidance purposes only with no guarantee or warranty (express or implied) as to its accuracy. The products described may be subject to change without notice, and should not be relied on without further advice from Bridon-Bekaert. The cross section image is for reference only. Actual cross sections vary due to diameter. Visit [www.bridon-bekaert.com](http://www.bridon-bekaert.com) for the most up-to-date data.



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## Bridon Dyform 8/PI/Bristar

High breaking force

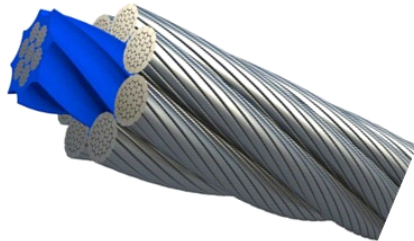
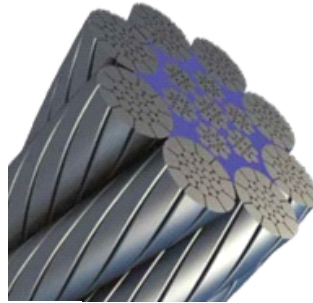
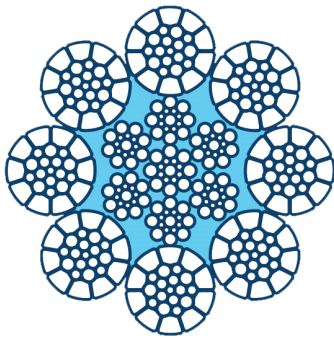
Superior bending fatigue life when compared with conventional eight strand ropes - confirmed by laboratory testing and extensive field experience

Highest strength boom hoist rope offered by Bridon

Excellent resistance to crushing and abrasion resulting from the overall compactness and robustness of the rope and the Dyform strands - recommended when multi-layer spooling is involved

Reduced elongation results from increased steel content and the Dyform process

Optional plastic coating (PI or Bristar) of IWRC to further extend fatigue life, improved structural stability and resistance to corrosion



# product table.

## BRIDON Dyform 8 / PI / Bristar

Diameter		Nominal length mass		Minimum Breaking Force					
				EIP/1960			EEIP/2160		
mm	inch	kg/m	lb/ft	kN	Tons (short)	Tonnes (metric)	kN	Tons (short)	Tonnes (metric)
	3/8	0.427	0.287	86.2	9.69	8.79	90.1	10.1	9.19
10.0		0.471	0.316	89.2	10.00	9.10	93.2	10.5	9.50
11.0		0.570	0.383	110	12.4	11.2	115	12.9	11.7
	7/16	0.582	0.391	110	12.4	11.2	115	12.9	11.7
12.0		0.678	0.456	128	14.4	13.1	134	15.1	13.7
	1/2	0.760	0.510	144	16.2	14.7	150	16.9	15.3
13.0		0.796	0.535	150	16.9	15.3	157	17.6	16.0
14.0		0.923	0.620	174	19.6	17.7	182	20.5	18.6
	9/16	0.961	0.646	181	20.3	18.5	189	21.2	19.3
15.0		1.06	0.712	198	22.3	20.2	207	23.3	21.1
	5/8	1.19	0.798	226	25.4	23.0	236	26.5	24.1
16.0		1.21	0.810	226	25.4	23.0	236	26.5	24.1
17.0		1.36	0.915	255	28.7	26.0	267	30	27.2
18.0		1.53	1.03	286	32.1	29.2	299	33.6	30.5
19.0		1.70	1.14	318	35.7	32.4	333	37.4	34
	3/4	1.71	1.15	318	35.7	32.4	333	37.4	34
20.0		1.88	1.27	353	39.7	36.0	369	41.5	37.6
22.0		2.28	1.53	427	48.0	43.5	446	50.1	45.5
	7/8	2.33	1.56	427	48.0	43.5	446	50.1	45.5
24.0		2.71	1.82	508	57.1	51.8	531	59.7	54.1
	1	3.04	2.04	569	64.0	58.0	595	66.9	60.7
26.0		3.18	2.14	596	67.0	60.8	623	70	63.5
28.0		3.69	2.48	691	77.7	70.5	723	81.3	73.7
	1 1/8	3.85	2.58	720	80.9	73.4	753	84.6	76.8
30.0		4.24	2.85	794	89.2	81.0	830	93.3	84.6
	1 1/4	4.75	3.19	903	102	92.1	944	106	96.3
32.0		4.82	3.24	903	102	92.1	944	106	96.3
34.0		5.44	3.66	1020	115	104	1070	120	109
	1 3/8	5.75	3.86	1080	121	110	1130	127	115
36.0		6.10	4.10		128	116	1200	135	122
38.0		6.80	4.57	1270	143	130	1330	149	136
	1 1/2	6.84	4.59	1270	143	130	1330	149	136
40.0		7.54	5.06	1410	158	144	1480	166	151
	1 5/8	8.02	5.39	1500	169	153	1570	176	160
42.0		8.31	5.58	1560	175	159	1630	183	166
44.0		9.12	6.13	1710	192	174	1790	201	183
	1 3/4	9.31	6.25	1710	192	174	1790	201	183
46.0		9.97	6.70	1870	210	191	1950	219	199
	1 7/8	10.7	7.18	2030	228	207	2130	239	217
48.0		10.9	7.29	2030	228	207	2130	239	217
50.0		11.8	7.91	2210	248	225	2310	260	236

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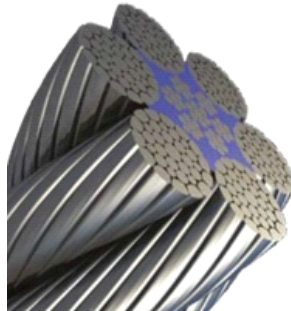
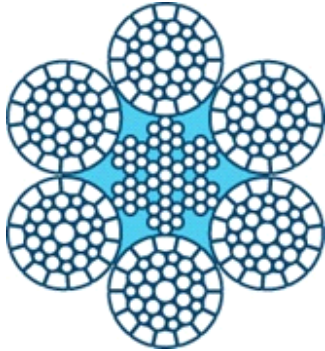
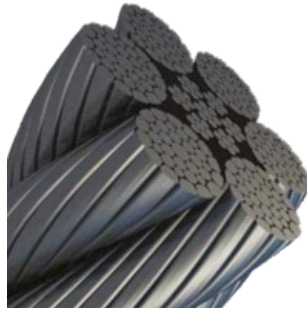
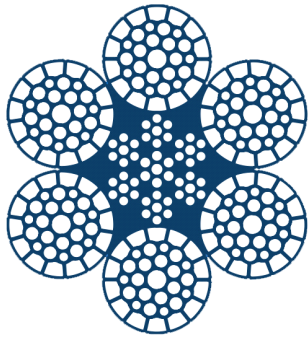
## Bridon Dyform 6/PI/Bristar

Strongest of all ropes in the six strand product range

Superior bending fatigue life when compared with conventional six strand ropes

Excellent resistance to crushing and abrasion resulting from the overall compactness and robustness of the rope and the Dyform strands - recommended when multi-layer spooling is involved

Reduced elongation results from increased steel content and the Dyform process



# product table.

## BRIDON Dyform 6 / PI / Bristar

Diameter		Nominal length mass		Minimum Breaking Force					
				EIP/1960			EEIP/2160		
mm	inch	kg/m	lb/ft	kN	Tons (short)	Tonnes (metric)	kN	Tons (short)	Tonnes (metric)
	5/16	0.289	0.194	55.2	6.20	5.63	57.5	6.46	5.86
8.00		0.294	0.197	55.2	6.20	5.63	57.5	6.46	5.86
9.00		0.372	0.250	69.9	7.86	7.13	72.8	8.18	7.42
	3/8	0.416	0.280	78.2	8.79	7.97	81.5	9.16	8.31
10.0		0.459	0.308	86.2	9.69	8.79	89.9	10.1	9.17
11.0		0.555	0.373	106	11.9	10.8	109	12.3	11.1
	7/16	0.567	0.381	106	11.9	10.8	109	12.3	11.1
12.0		0.661	0.444	124	13.9	12.6	129	14.5	13.2
	1/2	0.740	0.497	136	15.3	13.9	145	16.3	14.8
13.0		0.776	0.521	142	16.0	14.5	152	17.1	15.5
14.0		0.900	0.605	165	18.5	16.8	176	19.8	17.9
	9/16	0.937	0.630	172	19.3	17.5	183	20.6	18.7
15.0		1.03	0.694	190	21.4	19.4	202	22.7	20.6
	5/8	1.16	0.777	212	23.8	21.6	230	25.9	23.5
16.0		1.18	0.790	212	23.8	21.6	230	25.9	23.5
17.0		1.33	0.891	239	26.9	24.4	260	29.2	26.5
18.0		1.49	1.00	268	30.1	27.3	291	32.7	29.7
19.0		1.66	1.11	299	33.6	30.5	324	36.4	33.0
	3/4	1.67	1.12	299	33.6	30.5	324	36.4	33.0
20.0		1.84	1.23	331	37.2	33.8	359	40.4	36.6
22.0		2.22	1.49	401	45.1	40.9	435	48.9	44.4
	7/8	2.27	1.52	401	45.1	40.9	435	48.9	44.4
24.0		2.64	1.78	477	53.6	48.6	518	58.2	52.8
	1	2.96	1.99	534	60.0	54.5	580	65.2	59.1
26.0		3.10	2.09	560	62.9	57.1	607	68.2	61.9
28.0		3.60	2.42	649	73.0	66.2	704	79.1	71.8
	1 1/8	3.75	2.52	676	76.0	68.9	734	82.5	74.8
30.0		4.13	2.78	745	83.7	76.0	809	90.9	82.5
	1 1/4	4.63	3.11	848	95.3	86.5	920	103	93.8
32.0		4.70	3.16	848	95.3	86.5	920	103	93.8
34.0		5.31	3.57	957	108	97.6	1040	117	106
	1 3/8	5.60	3.76	1010	114	103	1100	124	112
36.0		5.95	4.00	1070	120	109	1160	130	118
38.0		6.63	4.45	1200	135	122	1300	146	133
	1 1/2	6.66	4.48	1200	135	122	1300	146	133
40.0		7.34	4.93	1320	148	135	1440	162	147
	1 5/8	7.82	5.25	1410	158	144	1530	172	156
42.0		8.10	5.44	1460	164	149	1580	178	161
44.0		8.89	5.97	1600	180	163	1740	196	177
	1 3/4	9.07	6.09	1600	180	163	1740	196	177
46.0		9.71	6.53	1750	197	178	1900	214	194
	1 7/8	10.4	7.00	1910	215	195	2070	233	211
48.0		10.6	7.11	1910	215	195	2070	233	211
50.0		11.5	7.71	2070	233	211	2250	253	229

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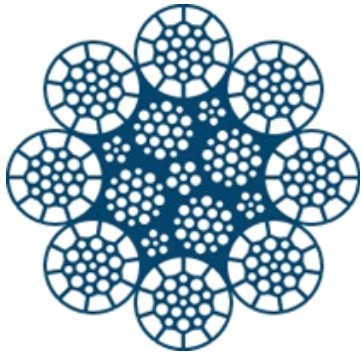
## **Bridon Dyform DSC8**

Very high breaking force

Crush resistant Dyform outer strands, increased fatigue resistance due to parallel laid construction

Reduced Lifetime costs

Exceptional service life



# BRIDON Dyform DSC8

Diameter		Nominal length mass		Minimum Breaking Force					
				EIP/1960			EEIP/2160		
mm	inch	kg/m	lb/ft	kN	Tons (short)	Tonnes (metric)	kN	Tons (short)	Tonnes (metric)
10		0.49	0.33	94	10.6	9.6	103.6	11.6	10.6
11		0.6	0.40	113.6	12.8	11.6	125.2	14.1	12.8
	7/16	0.61	0.41	113.6	12.8	11.6	125.2	14.1	12.8
12		0.71	0.48	135.5	15.2	13.8	149.3	16.8	15.2
	1/2	0.8	0.54	151.2	17.0	15.4	166.5	18.7	17.0
13		0.83	0.56	156	17.5	15.9	174.5	19.6	17.8
14		0.97	0.65	184.1	20.7	18.8	202.8	22.8	20.7
15		1.11	0.75	212.5	23.9	21.7	234.2	26.3	23.9
	5/8	1.26	0.85	241.9	27.2	24.7	266.5	30.0	27.2
16		1.27	0.85	241.9	27.2	24.7	266.5	30.0	27.2
17		1.43	0.96	275.0	30.9	28.0	302.0	33.9	30.8
18		1.61	1.08	308.4	34.7	31.4	339.8	38.2	34.6
19		1.79	1.20	340.3	38.3	34.7	375	42.2	38.2
	3/4	1.81	1.22	340.3	38.3	34.7	375	42.2	38.2
20		1.99	1.34	379	42.6	38.6	417.7	47.0	42.6
22		2.4	1.61	458.9	51.6	46.8	505.7	56.8	51.6
	7/8	2.44	1.64	458.9	51.6	46.8	505.7	56.8	51.6
24		2.86	1.92	542.8	61.0	55.4	598.2	67.2	61.0
	1	3.2	2.15	607.4	68.3	61.9	668.0	75.1	68.1
26		3.36	2.26	636	71.5	64.9	700.9	78.8	71.5
28		3.89	2.61	742.4	83.4	75.7	818.1	92.0	83.4
	1.1/8	4.06	2.73	776.3	87.3	79.2	853.5	95.94	87.0
30		4.47	3.00	855.3	96.1	87.2	942.6	106.0	96.1
32		5.02	3.37	968.2	108.8	98.7	1067	119.9	108.8
	1.1/4	5.08	3.41	968.2	108.8	98.7	1067	119.9	108.8

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## 1.2 Casar Crane Wire Ropes



## Eurolift

A premier hoist rope for mobile cranes, electrical hoists and other applications where rotation resistant ropes are required and it is especially suitable for multiple-layer spooling.

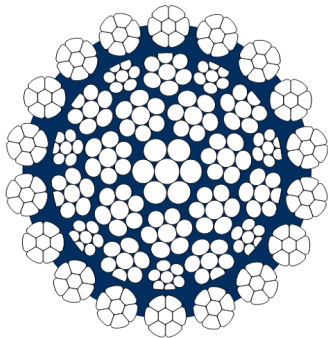
Flexible hoist rope made out of compacted outer strands and a compacted steel core.

Fully lubricated.

Has an extremely high breaking load and a very good resistance against drum crushing.

Has a core of special design avoiding crossovers between the strands of the core which reduces the danger of internal rope destruction.

Regular Lay or Langs Lay.



## PROPERTIES



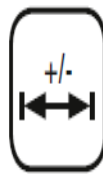
Swivel



Compacted



Lubricated



Tolerance

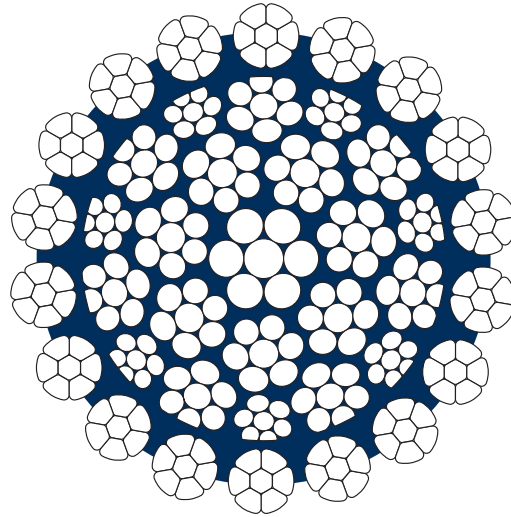
## Product Specifications

Name	ITEM #	Diameter	Metallic Area (mm <sup>2</sup> )	Approximate Mass (kg/100m)	Grade 1770 MBF (kN)	Grade 1960 MBF (kN)	Grade 2160 MBF (kN)
Eurolift 16mm		16	145.6	126.7	209.4	230.6	249.1
Eurolift 17mm		17	163.3	142.1	235.9	257.9	280.6
Eurolift 18mm		18	183.7	159.8	266.9	293.9	317.5
Eurolift 19mm		19	204	177.5	297.1	329	352.8
Eurolift 20mm		20	227.5	197.9	329.3	362.2	391.7
Eurolift 21mm		21	249	216.6	362.3	396.1	430.9
Eurolift 22mm		22	273.9	238.3	398.5	441.4	472
Eurolift 23mm		23	299.6	260.6	431.5	471.8	513.2
Eurolift 24mm		24	326.8	284.3	474.3	524.3	564.1
Eurolift 25mm		25	348.8	303.5	512.8	567.9	609.4
Eurolift 26mm		26	377.9	328.8	555	614.9	657.4
Eurolift 27mm		27	410.5	357.1	598.3	654.2	711.7
Eurolift 28mm		28	442.5	385	643.7	712.9	765.6



Eurolift 29mm	29	473.4	411.8	690.2	754.6	821
Eurolift 30mm	30	505.4	439.7	738.1	817.4	877.9
Eurolift 32mm	32	579.4	504	843.4	930	1002.8
Eurolift 34mm	34	652	567.3	950.8	1045	1130.9
Eurolift 36mm	36	735.6	640	1070	1185	1262.3

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## PROPERTIES



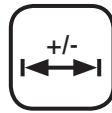
Swivel



Compacted



Lubricated



Tolerance

## APPLICATIONS

Has a core in a special design avoiding crossover between the strands of core and preventing internal rope destruction. Hoist rope for mobile cranes, electrical hoists and other applications, where rotation-resistant ropes are required.

## OVERVIEW

RCN	Diameter range [mm]	Number of outer strands	Number of wires	Number of outer load bearing wires	Average fill factor	Average weight factor	Average spin factor *N/mm <sup>2</sup>
23-3	10 – 34	18	280	126	0,720	0,87	0,82 (1770, 1960)*
23-3	36 – 60	18	292				0,80 (2160)*

- Temperature range of use: –50°C to +75°C
- Suitable for multilayer spooling in Lang's lay
- Available in ordinary lay and Lang's lay
- Available in right hand and left hand
- Available in galvanized and ungalvanized

nominal diameter	metallic area	weight	calculated aggregate breaking force						minimum breaking force					
			1770 N/mm <sup>2</sup>		1960 N/mm <sup>2</sup>		2160 N/mm <sup>2</sup>		1770 N/mm <sup>2</sup>		1960 N/mm <sup>2</sup>		2160 N/mm <sup>2</sup>	
			kN	t [metric]	kN	t [metric]	kN	t [metric]	kN	t [metric]	kN	t [metric]	kN	t [metric]
10	56,2	0,49	99,4	10,14	110,1	11,23	121,3	12,37	81,9	8,33	89,6	9,14	97,4	9,86
11	68,7	0,60	121,5	12,39	134,6	13,72	148,3	15,12	99,5	10,12	108,8	11,11	118,4	11,98
12	82,0	0,71	145,1	14,79	160,7	16,38	177,1	18,05	118,2	12,10	130,8	13,30	139,9	14,16
12,7	90,8	0,79	160,8	16,40	178,0	18,16	196,2	20,01	132,2	13,48	146,4	14,93	161,4	16,45
13	95,2	0,83	168,5	17,18	186,6	19,02	205,6	20,96	139,0	14,14	152,7	15,60	165,4	16,73
14	110,4	0,96	195,4	19,93	216,4	22,07	238,5	24,32	161,7	16,50	179,1	18,30	190,9	19,31
15	126,3	1,10	223,5	22,79	247,5	25,24	272,7	27,81	184,5	18,80	204,0	20,80	219,5	22,21
16	145,6	1,27	257,7	26,28	285,4	29,10	314,5	32,07	209,4	21,29	230,6	23,50	249,1	25,20
17	163,3	1,42	289,1	29,48	320,1	32,64	352,8	35,97	235,9	23,99	257,9	26,32	280,6	28,39
18	183,7	1,60	325,1	33,15	360,0	36,71	396,7	40,46	266,9	27,15	293,9	30,00	317,5	32,13
19	204,0	1,78	361,1	36,82	399,8	40,77	440,6	44,93	297,1	30,30	329,0	33,50	352,8	35,70
20	227,5	1,98	402,6	41,06	445,9	45,47	491,4	50,10	329,3	33,49	362,2	36,90	391,7	39,64
21	249,0	2,17	440,7	44,93	488,0	49,76	537,8	54,84	362,3	36,84	396,1	40,20	430,9	43,60
22	273,9	2,38	484,8	49,44	536,9	54,75	591,7	60,33	398,5	40,60	441,4	45,00	472,0	47,76
23	299,6	2,61	530,2	54,07	587,1	59,87	647,0	65,98	431,5	43,88	471,8	48,14	513,2	51,94
24	326,8	2,84	578,5	58,99	640,6	65,32	706,0	71,99	474,3	48,30	524,3	53,50	564,1	57,08
25	348,8	3,04	617,4	62,96	683,7	69,72	753,5	76,84	512,8	52,30	567,9	57,90	609,4	61,67
26	377,9	3,29	668,9	68,21	740,7	75,53	816,2	83,23	555,0	56,60	614,9	62,70	657,4	66,52
27	410,5	3,57	726,5	74,08	804,5	82,03	886,6	90,41	598,3	60,85	654,2	66,75	711,7	72,02
28	442,5	3,85	783,3	79,87	867,4	88,45	955,9	97,47	643,7	65,60	712,9	72,70	765,6	77,47
29	473,4	4,12	837,9	85,44	927,8	94,61	1022,5	104,27	690,2	70,19	754,6	77,00	821,0	83,07
30	505,4	4,40	894,6	91,23	990,7	101,02	1091,7	111,33	738,1	75,30	817,4	83,40	877,9	88,84
31	539,7	4,70	955,3	97,41	1057,8	107,86	1165,7	118,87	785,3	80,08	869,7	88,68	958,4	97,73
32	579,4	5,04	1025,5	104,57	1135,5	115,79	1251,4	127,61	843,4	85,74	930,0	94,90	1002,8	101,48
33	616,1	5,36	1090,6	111,21	1207,6	123,14	1330,9	135,71	896,6	91,43	992,8	101,24	1094,1	111,57
34	652,0	5,67	1154,1	117,68	1278,0	130,32	1408,4	143,61	950,8	96,69	1045,0	106,60	1130,9	114,44
36	735,6	6,40	1302,1	132,77	1441,8	147,03	1589,0	162,03	1070,0	109,10	1185,0	120,90	1262,3	127,74
38	815,3	7,09	1443,0	147,15	1597,9	162,94	1761,0	179,57	1191,0	121,50	1319,0	134,50	1412,2	142,90
40	909,9	7,92	1610,5	164,23	1783,4	181,86	1965,4	200,42	1360,0	138,00	1462,0	149,10	1560,4	157,90
42	1000,8	8,71	1771,4	180,63	1961,5	200,02	2161,7	220,43	1455,0	147,97	1611,2	164,41	1667,4	169,83
44	1098,1	9,55	1943,6	198,19	2152,2	219,46	2371,8	241,86	1596,0	162,80	1767,0	180,20	1823,7	185,75
46	1204,8	10,48	2132,5	217,46	2361,4	240,80	2602,4	265,37	1748,0	178,30	1935,0	197,40	1989,7	202,65
48	1310,4	11,40	2319,4	236,51	2568,4	261,90	2830,5	288,63	1908,4	194,30	2113,3	215,64	2187,0	222,75
50	1414,1	12,30	2503,0	255,24	2771,7	282,64	3054,5	311,48	2052,5	209,30	2272,8	231,76	2504,7	255,41
52	1531,7	13,33	2711,2	276,46	3002,2	306,14	3308,5	337,38	2223,2	226,70	2461,8	251,03	2713,0	276,65
54	1649,6	14,35	2919,8	297,73	3233,2	329,69	3563,1	363,33	2394,2	244,14	2651,2	270,35	2921,7	297,93
56	1774,0	15,43	3140,0	320,20	3477,1	354,57	3831,9	390,75	2574,8	262,56	2851,2	290,74	3142,2	320,41
58	1903,0	16,56	3368,3	343,47	3729,9	380,34	4110,5	419,16	2762,0	281,65	3058,5	311,88	3370,6	343,71
60	2036,5	17,72	3604,6	367,57	3991,6	407,03	4398,9	448,56	2955,8	301,41	3273,1	333,76	3607,1	367,82

Special constructions and diameters available - please contact us directly.



## Powerplast

Hoist rope for deck cranes and offshore cranes, and other applications in the marine environment, where rotation resistant ropes are required.

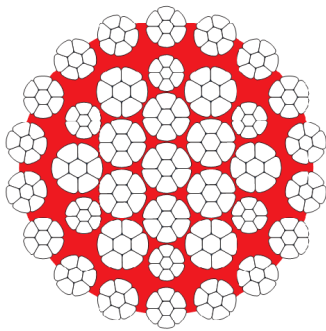
Is a rotation resistant hoist rope made out of compacted strands.

Is fully lubricated.

Has a plastic layer between the steel core and the outer strands giving the rope a high structural stability. The plastic layer also assists in avoiding internal rope destruction and protecting the core against corrosive environments.

Has a high breaking load and good resistance against drum crushing.

Regular Lay or Langs Lay.



## PROPERTIES



Plast rope



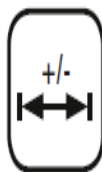
Compacted



Swivel



Lubricated



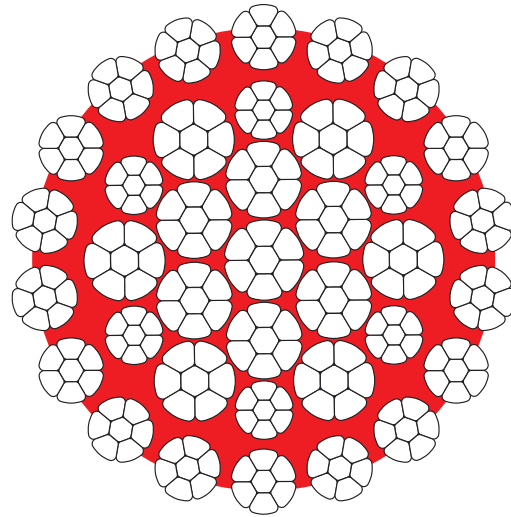
Tolerance

## Product Specifications

Name	ITEM #	Diameter	Metallic Area (mm <sup>2</sup> )	Approximate Mass (kg/100m)	Grade 1770 MBF (kN)	Grade 1960 MBF (kN)	Grade 2160 MBF (kN)
Powerplast 42mm		42	1013.4	891.8	1455	1611.2	1766.3
Powerplast 40mm		40	926.6	815.4	1360	1462	1615
Powerplast 38mm		38	826.4	727.3	1191	1319	1440.3
Powerplast 36mm		36	738.9	650	1070	1185	1287.3
Powerplast 34mm		34	656.9	578.1	950.8	1045	1144.9
Powerplast 32mm		32	584.9	514.7	843.4	930	1019.4
Powerplast 30mm		30	514.4	452.7	738.1	817.4	896.5
Powerplast 28mm		28	446.6	393	643.7	712.9	778.4
Powerplast 26mm		26	389.2	342.5	555	614.9	678.3
Powerplast 25mm		25	358.3	315.3	512.8	567.9	624.5
Powerplast 24mm		24	326.3	287.2	474.3	524.3	568.7
Powerplast 23mm		23	300.9	265	431.4	477.6	524.4
Powerplast 22mm		22	276.2	243	398.5	441.4	481.4

Powerplast 21mm	21	251.9	222	361.2	400	439
Powerplast 20mm	20	227.7	200.4	329.3	362.2	396.9
Powerplast 19mm	19	207.2	182.4	297.7	329	361.1
Powerplast 18mm	18	186.7	164.3	266.9	293.9	325.4
Powerplast 17mm	17	164.2	145	235.4	260.7	286.2
Powerplast 16mm	16	147	129.4	209.4	230.6	256.2
Powerplast 15mm	15	127.6	112.3	184.5	204	222.4
Powerplast 14mm	14	111.7	98.3	161.7	179.1	194.7
Powerplast 13mm	13	97.2	85.6	139	152.7	169.4
Powerplast 12mm	12	81.8	72	118.2	130.8	142.6

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## PROPERTIES



Plast rope



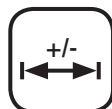
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Swivel



Lubricated



Tolerance

## APPLICATIONS

Has a high breaking load and a good resistance against drum crushing. Hoist rope for deck cranes and offshore cranes, pull-in-riser and other applications in the marine environment, where rotation resistant-ropes are required.

## OVERVIEW

RCN	Diameter range [mm]	Number of outer strands	Number of wires	Number of outer load bearing wires	Average fill factor	Average weight factor	Average spin factor
23-3	12-56	18	259	126			0,81
28	58-72	18	593	270	0,727	0,88	0,84 (1770, 1960)* 0,81 (2160)*

- Temperature range of use: -50°C to +115°C
- Suitable for multilayer spooling in Lang's lay
- Available in ordinary lay and Lang's lay
- Available in right hand and left hand
- Only available in galvanized execution

nominal diameter	metallic area	weight	calculated aggregate breaking force						minimum breaking force							
			1770 N/mm <sup>2</sup>		1960 N/mm <sup>2</sup>		2160 N/mm <sup>2</sup>		1770 N/mm <sup>2</sup>		1960 N/mm <sup>2</sup>		2160 N/mm <sup>2</sup>			
mm	mm <sup>2</sup>	kg/m	kN	t [metric]	kN	t [metric]	kN	t [metric]	kN	t [metric]	kN	t [metric]	kN	t [metric]	kN	t [metric]
12	81,8	0,72	144,8	14,76	160,3	16,35	176,7	18,02	118,2	12,10	130,8	13,30	142,6	14,54		
13	97,2	0,86	172,1	17,55	190,5	19,43	210,0	21,41	139,0	14,14	152,7	15,60	169,4	17,28		
14	111,7	0,98	197,6	20,15	218,8	22,32	241,3	24,60	161,7	16,50	179,1	18,30	194,7	19,85		
15	127,6	1,12	225,9	23,03	250,1	25,51	275,6	28,11	184,5	18,80	204,0	20,80	222,4	22,68		
16	147,0	1,29	260,2	26,54	288,2	29,38	317,5	32,38	209,4	21,29	230,6	23,50	256,2	26,13		
17	164,2	1,45	290,7	29,64	321,9	32,82	354,7	36,17	235,4	24,01	260,7	26,59	286,2	29,18		
18	186,7	1,64	330,5	33,71	366,0	37,32	403,3	41,12	266,9	27,15	293,9	30,00	325,4	33,18		
19	207,2	1,82	366,8	37,40	406,2	41,42	447,6	45,64	297,1	30,30	329,0	33,50	361,1	36,83		
20	227,7	2,00	403,0	41,09	446,2	45,50	491,8	50,15	329,3	33,49	362,2	36,90	396,9	40,47		
21	251,9	2,22	445,9	45,47	493,8	50,35	544,1	55,48	361,2	36,83	400,0	40,79	439,0	44,77		
22	276,2	2,43	488,8	49,85	541,3	55,20	596,6	60,84	398,5	40,60	441,4	45,00	481,4	49,09		
23	300,9	2,65	532,6	54,31	589,7	60,13	649,9	66,28	431,4	43,99	477,6	48,71	524,4	53,48		
24	326,3	2,87	577,6	58,90	639,6	65,22	704,8	71,87	474,3	48,30	524,3	53,50	568,7	57,99		
25	358,3	3,15	634,2	64,67	702,3	71,61	773,9	78,92	512,8	52,30	567,9	57,90	624,5	63,68		
26	389,2	3,43	688,9	70,24	762,8	77,78	840,7	85,73	555,0	56,60	614,9	62,70	678,3	69,17		
27	417,9	3,68	739,8	75,43	819,2	83,53	902,7	92,05	599,2	61,10	663,5	67,66	728,4	74,27		
28	446,6	3,93	790,5	80,61	875,3	89,26	964,7	98,37	643,7	65,60	712,9	72,70	778,4	79,37		
29	482,2	4,24	853,4	87,02	945,0	96,36	1041,6	106,21	691,3	70,49	765,4	78,05	840,4	85,70		
30	514,4	4,53	910,5	92,84	1008,2	102,81	1111,1	113,30	738,1	75,30	817,4	83,40	896,5	91,42		
31	554,2	4,88	980,0	100,03	1086,3	110,77	1197,1	122,07	794,6	81,03	879,9	89,72	965,9	98,50		
32	584,9	5,15	1035,3	105,57	1146,4	116,90	1263,4	128,83	843,4	85,74	930,0	94,90	1019,4	103,95		
33	624,3	5,49	1105,1	112,68	1223,7	124,78	1348,5	137,51	895,1	91,27	991,2	101,07	1088,1	110,96		
34	656,9	5,78	1162,7	118,57	1287,6	131,29	1418,9	144,69	950,8	96,69	1045,0	106,60	1144,9	116,75		
36	738,6	6,50	1307,3	133,31	1447,6	147,62	1595,4	162,68	1070,0	109,10	1185,0	120,90	1287,3	131,27		
38	826,4	7,27	1462,8	149,16	1619,8	165,17	1785,0	182,02	1191,0	121,50	1319,0	134,50	1440,3	146,87		
40	926,6	8,15	1640,1	167,24	1816,2	185,20	2001,5	204,09	1360,0	138,00	1462,0	149,10	1615,0	164,68		
42	1013,4	8,92	1793,7	182,91	1986,3	202,54	2188,9	223,21	1455,0	147,97	1611,2	164,41	1766,3	180,11		
44	1107,6	9,75	1960,4	199,90	2170,8	221,36	2392,4	243,96	1596,0	162,80	1767,0	180,20	1930,4	196,85		
46	1220,6	10,74	2160,5	220,30	2392,4	243,95	2636,5	268,85	1748,0	178,30	1935,0	197,40	2127,4	216,94		
48	1323,7	11,65	2343,0	238,92	2594,5	264,56	2859,2	291,56	1908,4	194,30	2113,3	215,64	2307,1	235,26		
50	1427,1	12,56	2526,0	257,58	2797,1	285,23	3082,5	314,33	2069,0	211,10	2292,0	233,70	2487,3	253,64		
52	1563,0	13,75	2766,4	282,10	3063,4	312,38	3376,1	344,27	2200,0	223,70	2436,0	248,60	2724,2	277,79		
54	1662,1	14,63	2941,9	299,99	3257,7	332,19	3590,1	366,10	2377,0	241,80	2632,0	268,60	2896,9	295,40		
56	1797,9	15,82	3182,2	324,50	3523,8	359,33	3883,5	396,01	2577,6	262,84	2854,3	291,06	3133,6	319,54		
58	1938,7	17,06	3431,6	349,92	3799,9	387,48	4187,6	427,02	2779,5	283,44	3077,9	313,86	3379,0	344,56		
60	2074,1	18,25	3671,2	374,36	4065,3	414,54	4480,1	456,84	2973,6	303,23	3292,8	335,78	3615,0	368,63		
62	2154,0	18,96	3812,6	388,78	4221,8	430,51	4652,6	474,44	3202,6	326,57	3546,3	361,63	3754,2	382,83		
64	2309,9	20,33	4088,6	416,92	4527,5	461,68	4989,5	508,79	3434,4	350,22	3803,1	387,81	4026,0	410,54		
66	2451,7	21,58	4339,5	442,51	4805,4	490,01	5295,7	540,02	3645,2	371,71	4036,5	411,61	4273,1	435,74		
68	2594,7	22,83	4592,6	468,32	5085,6	518,60	5604,6	571,51	3857,8	393,39	4271,9	435,62	4522,3	461,15		
70	2730,5	24,03	4833,0	492,84	5351,8	545,74	5897,9	601,43	4059,7	413,98	4495,5	458,42	4759,0	485,29		
72	2897,1	25,49	5127,9	522,91	5678,4	579,04	6257,8	638,12	4317,0	440,22	4780,4	487,47	5049,4	514,90		

Special constructions and diameters available - please contact us directly.





## Turboplast

Boom hoist rope for mobile cranes and grabs, hoist rope for container cranes, floating cranes etc. In multiple part reeving for smaller lifting height.

Is an 8 strand rope made out of compacted outer strands.

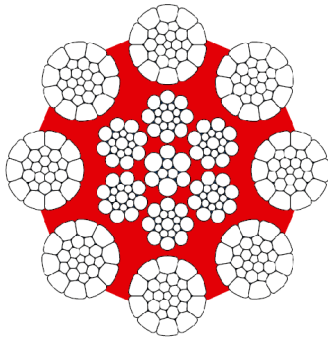
Is fully lubricated.

Has a plastic layer between the steel core and the outer strands giving the rope a high structural stability. The plastic layer also assists in avoiding internal rope destruction and protecting the core against corrosive environments.

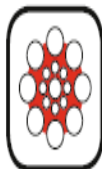
Has a very high breaking load and good resistance against drum crushing.

Turboplast should NOT be used with a swivel.

Regular Lay or Langs Lay.



## PROPERTIES



Plast rope



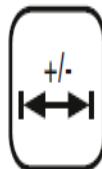
Compacted



Lubricated



No Swivel

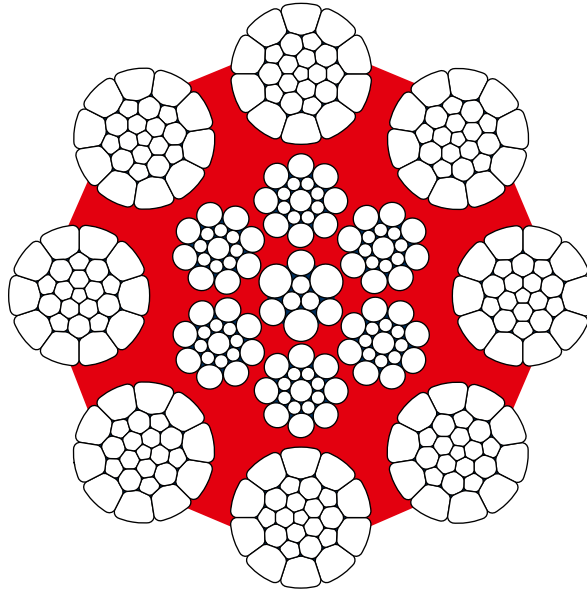


Tolerance

## Product Specifications

Name	ITEM #	Diameter	Metallic Area (mm <sup>2</sup> )	Approximate Mass (kg/100m)	Grade 1770 MBF (kN)	Grade 1960 MBF (kN)	Grade 2160 MBF (kN)
Turboplast 36mm		36	670.5	583.4	1040.1	1129.2	1217
Turboplast 32mm		32	533.7	464.3	828	911	968
Turboplast 28mm		28	405.2	352.5	629.6	697.3	748
Turboplast 26mm		26	352.4	306.6	548.9	607.8	655
Turboplast 24mm		24	299.5	260.6	464.5	514.3	556
Turboplast 22mm		22	251.9	219.1	391.7	433.7	468
Turboplast 20mm		20	210.7	183.3	321	355.5	391
Turboplast 18mm		18	168.9	146.9	260.2	288.2	314
Turboplast 16mm		16	135.5	117.9	207.2	229.4	252

**IMPROVED  
DESIGN**



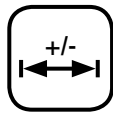
## PROPERTIES



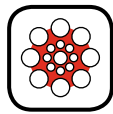
No Swivel



Lubricated



Tolerance



Plast rope



Compacted

## APPLICATIONS

High breaking load and good resistance against crushing. Hoisting rope in multiple part reeving for smaller lifting heights as well as for twin hoist systems with left and right hand lay ropes for greater lifting heights.

## OVERVIEW

RCN	Diameter range [mm]	Number of outer strands	Number of wires	Number of outer load bearing wires	Average fill factor	Average nominal metallic area factor C	Average spin factor *N/mm <sup>2</sup>
09	8	8	259	208			
09	9–24	8	319	208	0,664	0,522	0,89 (1770)*
09	25–48	8	327	208			0,88 (1960)*
11	50–72	8	367	248			0,86 (2160)*

- Temperature range of use: –50°C to +115°C
- Suitable for multi-layer spooling in Lang's lay
- Available in ordinary lay and Lang's lay
- Available in right hand and left hand
- Available in galvanized and ungalvanized

nominal diameter	metallic area	weight	calculated aggregate breaking force						minimum breaking force					
			1770 N/mm <sup>2</sup>		1960 N/mm <sup>2</sup>		2160 N/mm <sup>2</sup>		1770 N/mm <sup>2</sup>		1960 N/mm <sup>2</sup>		2160 N/mm <sup>2</sup>	
mm	mm <sup>2</sup>	kg/m	kN	t [metric]	kN	t [metric]	kN	t [metric]	kN	t [metric]	kN	t [metric]	kN	t [metric]
8	33,4	0,30	59,1	6,03	65,4	6,67	72,1	7,35	52,3	5,33	58,0	5,91	63,5	6,48
9	42,1	0,37	75,7	7,72	83,9	8,56	92,4	9,42	67,6	6,89	74,0	7,55	81,4	8,30
10	53,0	0,47	93,7	9,55	103	10,5	114	11,6	82,2	8,38	90,0	9,18	101	10,2
11	63,8	0,57	112	11,4	124	12,6	137	13,9	99,5	10,1	109	11,1	121	12,3
12	75,7	0,67	134	13,6	148	15,0	163	16,6	117	11,9	130	13,2	144	14,6
13	89,5	0,79	158	16,1	175	17,8	193	19,6	140	14,2	153	15,6	170	17,3
14	103,1	0,91	182	18,5	202	20,5	222	22,6	161	16,4	177	18,0	196	19,9
15	119,0	1,05	210	21,4	233	23,7	257	26,2	187	19,0	205	20,9	226	23,0
16	135,5	1,20	239	24,3	265	27,0	292	29,7	212	21,6	232	23,6	252	25,6
17	152,4	1,35	269	27,4	298	30,3	329	33,5	236	24,0	259	26,4	283	28,8
18	168,9	1,50	299	30,4	331	33,7	364	37,1	266	27,1	292	29,7	314	32,0
19	189,0	1,67	334	34,0	370	37,7	408	41,6	299	30,4	327	33,3	351	35,7
20	210,7	1,87	372	37,9	412	42,0	455	46,3	329	33,5	361	36,8	391	39,8
21	226,9	2,01	401	40,8	444	45,2	490	49,9	359	36,6	394	40,1	421	42,9
22	252,0	2,24	445	45,3	493	50,2	544	55,4	401	40,8	439	44,7	468	47,7
23	275,1	2,44	486	49,5	539	54,9	594	60,5	436	44,4	478	48,7	511	52,1
24	299,5	2,66	530	54,0	587	59,8	646	65,8	476	48,5	521	53,1	556	56,6
25	324,2	2,88	573	58,4	635	64,7	700	71,3	516	52,6	566	57,7	602	61,3
26	352,4	3,13	623	63,5	690	70,3	761	77,6	562	57,3	616	62,8	655	66,7
27	380,3	3,37	673	68,6	745	75,9	821	83,7	599	61,0	657	66,9	702	71,5
28	405,2	3,59	717	73,1	794	80,9	875	89,2	645	65,7	707	72,0	748	76,2
29	436,0	3,87	771	78,6	854	87,0	941	95,9	695	70,8	760	77,4	807	82,3
30	470,8	4,18	833	84,9	922	94,0	1016	103,6	745	75,9	813	82,9	871	88,8
31	502,3	4,46	889	90,6	984	100,3	1084	110,5	796	81,1	869	88,6	930	94,8
32	533,7	4,73	944	96,2	1046	106,6	1152	117,4	848	86,4	938	95,6	988	100,7
33	571,8	5,07	1012	103,1	1120	114,2	1235	125,9	897	91,4	979	99,8	1059	108,0
34	601,4	5,33	1064	108,4	1178	120,1	1299	132,4	959	97,7	1055	107,5	1114	113,6
36	670,5	5,95	1186	120,9	1314	133,9	1448	147,6	1066	108,7	1164	118,6	1242	126,6
38	753,1	6,68	1333	135,9	1476	150,5	1626	165,8	1192	121,5	1301	132,6	1395	142,2
40	837,9	7,43	1483	151,2	1642	167,4	1809	184,4	1317	134,2	1438	146,6	1552	158,2
42	914,7	8,11	1619	165,0	1792	182,7	1975	201,3	1457	148,5	1591	162,2	1694	172,7
44	1010,7	8,96	1788	182,3	1980	201,9	2183	222,6	1593	162,4	1739	177,3	1873	190,9
46	1102,4	9,78	1951	198,9	2160	220,2	2381	242,7	1755	178,9	1916	195,3	2042	208,2
48	1201,1	10,65	2125	216,6	2354	240,0	2594	264,5	1905	194,2	2079	212,0	2225	226,8
50	1303,7	11,56	2307	235,2	2555	260,5	2816	287,1	2036	207,6	2265	230,9	2423	247,0
52	1409,4	12,50	2494	254,3	2762	281,6	3044	310,4	2201	224,4	2448	249,6	2620	267,1
54	1520,5	13,48	2690	274,3	2979	303,7	3283	334,7	2375	242,1	2641	269,3	2826	288,1
56	1628,1	14,44	2881	293,7	3191	325,3	3516	358,5	2543	259,3	2828	288,3	3027	308,6
58	1739,3	15,42	3078	313,8	3408	347,5	3756	383,0	2716	276,9	3022	308,1	3234	329,7
60	1865,9	16,55	3302	336,7	3657	372,9	4030	410,9	2914	297,1	3242	330,5	3469	353,7
62	1994,2	17,68	3529	359,8	3908	398,5	4307	439,1	3113	317,4	3364	343,0	3708	378,1
64	2132,4	18,91	3774	384,8	4179	426,1	4605	469,5	3329	339,4	3597	366,7	3965	404,3
66	2272,3	20,15	4021	410,0	4453	454,0	4908	500,4	3547	361,6	3833	390,8	4225	430,8
68	2403,4	21,31	4254	433,7	4710	480,2	5191	529,3	3752	382,6	4055	413,4	4468	455,6
70	2537,6	22,50	4491	457,9	4973	507,1	5481	558,9	3962	404,0	4281	436,5	4718	481,1
72	2689,8	23,85	4761	485,4	5272	537,5	5810	592,4	4200	428,2	4538	462,7	5001	509,9

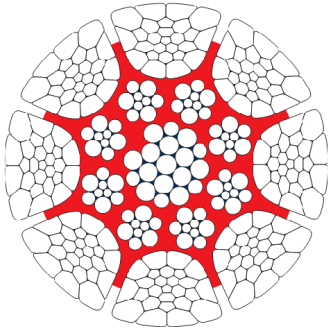
Special constructions and diameters available - please contact us directly.



## Parafit

Boom hoist rope for mobile and tower cranes and grabs, hoist rope for container cranes, floating cranes, portal cranes, electrical hoists and lifting devices where rotation resistant ropes are not required. Highest breaking loads. Especially suitable for multiple layer spooling.

Parafit is available in from 8mm to 50mm diameter, download attached pdf if the rope specification you need is not listed in the table below.



## PROPERTIES



Plast rope



Compacted



Swaged



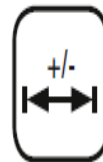
Parallel  
Construction



Lubricated



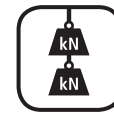
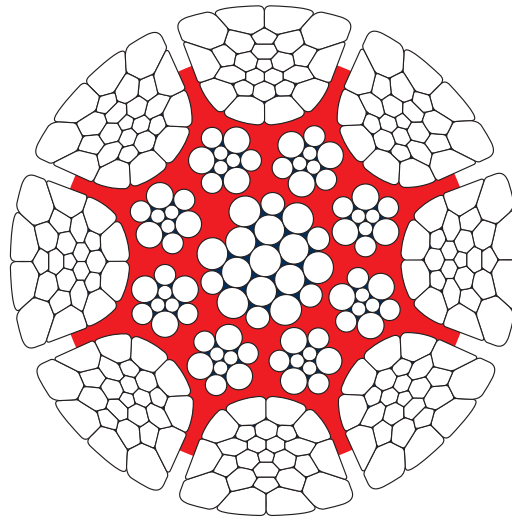
No Swivel



Tolerance

## Product Specifications

Name	ITEM #	Diameter	Metallic Area (mm <sup>2</sup> )	Approximate Mass (kg/100m)	Grade 1770 MBF (kN)	Grade 1960 MBF (kN)	Grade 2160 MBF (kN)
Parafit 32mm		32	597.5	508	0	1018.9	1110
Parafit 30mm		30	529.1	450	0	902.2	982.9
Parafit 28mm		28	459.1	390	0	782.8	852.7
Parafit 26mm		26	393.9	335	0	671.7	731.7
Parafit 24mm		24	337.9	287	0	576.1	627.6
Parafit 22mm		22	284.5	242	0	485.2	528.5
Parafit 20mm		20	233.7	199	0	398.5	434.1
Parafit 18mm		18	189.2	161	0	322.7	351.5
Parafit 16mm		16	149.6	127	0	255.1	277.9



Very High  
breaking force

## PROPERTIES



Plast rope



Compacted



Swaged



Parallel  
Construction



Lubricated



No Swivel



Tolerance

## APPLICATIONS

Boom hoist rope for all kind of crawler cranes and mobile cranes especially suited for multi-layer spooling.

## OVERVIEW

RCN	Diameter range [mm]	Number of outer strands	Number of wires	Number of outer load bearing wires	Average fill factor	Average weight factor	Average spin factor *N/mm <sup>2</sup>
09	8–50	8	298	208	0,744	0,85	0,87 (1960)* 0,86 (2160)*

- Temperature range of use: –50°C to +115°C
- Suitable for multi-layer spooling
- Only available in ordinary lay
- Available in right hand and left hand
- Available in galvanized and ungalvanized

nominal diameter	metallic area	weight	calculated aggregate breaking force				minimum breaking force			
			1960 N/mm <sup>2</sup>		2160 N/mm <sup>2</sup>		1960 N/mm <sup>2</sup>		2160 N/mm <sup>2</sup>	
			kN	t [metric]	kN	t [metric]	kN	t [metric]	kN	t [metric]
8	37,0	0,31	72,5	7,39	79,9	8,14	63,1	6,43	68,7	7,00
9	46,6	0,40	91,3	9,31	100,6	10,26	79,4	8,10	86,5	8,82
10	57,1	0,49	111,9	11,41	123,3	12,57	97,3	9,93	106,0	10,81
11	71,2	0,61	139,6	14,24	153,9	15,69	121,5	12,39	132,4	13,50
12	82,7	0,70	162,0	16,52	178,6	18,21	141,0	14,37	153,6	15,66
13	97,9	0,83	191,9	19,56	211,4	21,56	166,9	17,02	181,8	18,54
14	114,9	0,98	225,1	22,95	248,1	25,30	195,8	19,97	213,4	21,76
15	130,9	1,11	256,5	26,16	282,7	28,83	223,2	22,76	243,1	24,79
16	149,6	1,27	293,2	29,89	323,1	32,95	255,1	26,01	277,9	28,33
17	171,1	1,45	335,3	34,20	369,6	37,68	291,8	29,75	317,8	32,41
18	189,2	1,61	370,9	37,82	408,7	41,68	322,7	32,90	351,5	35,84
19	213,7	1,82	418,9	42,71	461,6	47,07	364,4	37,16	397,0	40,48
20	233,7	1,99	458,0	46,70	504,7	51,47	398,5	40,63	434,1	44,26
21	256,5	2,18	502,8	51,27	554,1	56,50	437,5	44,61	476,5	48,59
22	284,5	2,42	557,6	56,86	614,5	62,67	485,2	49,47	528,5	53,89
23	309,8	2,63	607,2	61,92	669,2	68,24	528,3	53,87	575,5	58,69
24	337,9	2,87	662,2	67,53	729,8	74,42	576,1	58,75	627,6	64,00
25	366,2	3,11	717,7	73,19	790,9	80,65	624,4	63,67	680,2	69,36
26	393,9	3,35	772,1	78,73	850,9	86,76	671,7	68,50	731,7	74,62
27	426,5	3,63	835,9	85,24	921,2	93,93	727,2	74,15	792,2	80,78
28	459,1	3,90	899,8	91,75	991,6	101,11	782,8	79,82	852,7	86,96
29	491,5	4,18	963,3	98,23	1061,6	108,25	838,0	85,46	912,9	93,09
30	529,1	4,50	1037,1	105,75	1142,9	116,54	902,2	92,00	982,9	100,23
32	597,5	5,08	1171,2	119,43	1290,7	131,61	1018,9	103,90	1110,0	113,19
34	678,7	5,77	1330,2	135,65	1466,0	149,49	1157,3	118,01	1260,7	128,56
36	757,5	6,44	1484,6	151,39	1636,1	166,84	1291,6	131,71	1407,0	143,48
38	848,2	7,21	1662,5	169,52	1832,1	186,82	1446,4	147,49	1575,6	160,67
40	934,7	7,95	1832,0	186,81	2018,9	205,87	1593,8	162,53	1736,3	177,05
42	1031,0	8,76	2019,8	205,96	2225,9	226,97	1757,2	179,18	1914,2	195,20
44	1138,0	9,67	2229,7	227,36	2457,2	250,56	1939,8	197,81	2113,2	215,49
46	1241,0	10,55	2431,9	247,99	2680,1	273,29	2115,8	215,75	2304,9	235,03
48	1351,0	11,49	2648,5	270,07	2918,7	297,63	2304,2	234,96	2510,1	255,96
50	1455,0	12,36	2850,9	290,71	3141,8	320,38	2480,3	252,92	2702,0	275,52

Special constructions and diameter available - please contact us directly.





# Paraplast

Hoist rope for electrical hoists and lifting devices with multiple part reeving, where a rotation resistant rope is not needed due to great lifting heights, low number of falls or non-guided loads. High breaking load.

Is an 8 strand rope in parallel lay construction made out of compacted outer strands.

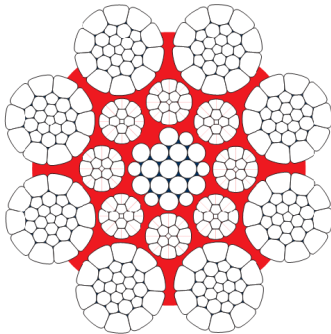
Is fully lubricated.

Has a plastic layer between the steel core and the outer strands.

Has a very high breaking load.

Paraplast should NOT be used with a swivel.

Regular Lay or Langs Lay.



## PROPERTIES



Plast rope



Compacted



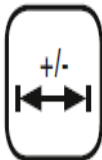
Parallel Construction



Lubricated



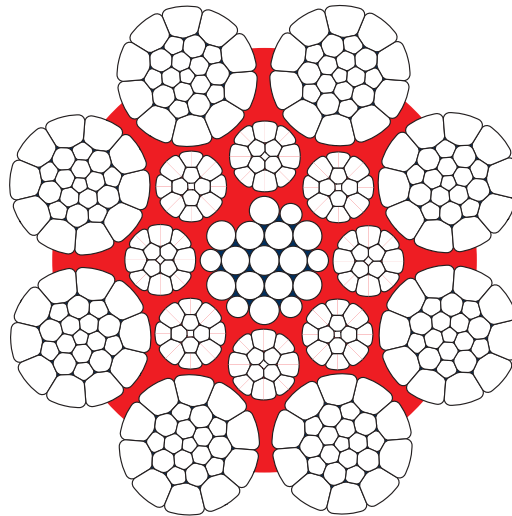
No Swivel



Tolerance

## Product Specifications

Name	ITEM #	Diameter	Metallic Area (mm <sup>2</sup> )	Approximate Mass (kg/100m)	Grade 1770 MBF (kN)	Grade 1960 MBF (kN)	Grade 2160 MBF (kN)
Paraplast 18mm		18	176.4	150	274.8	304.3	327.7
Paraplast 17mm		17	158.5	134.7	246.8	273.3	294.4
Paraplast 16mm		16	139.4	118.5	217.1	240.4	258.9
Paraplast 15mm		15	123.1	104.6	191.7	212.3	228.6
Paraplast 14mm		14	107.1	91.1	166.9	184.8	199
Paraplast 13mm		13	92.6	78.7	144.2	159.7	172
Paraplast 12mm		12	79.6	67.6	123.9	137.2	147.8
Paraplast 11mm		11	65.7	55.9	102.4	113.4	122.1
Paraplast 10mm		10	54.2	46.1	84.5	93.5	100.7
Paraplast 09mm		9	44.1	37.4	68.6	76	81.8
Paraplast 08mm		8	34.8	29.6	54.2	60	64.6
Paraplast 07mm		7	26.3	22.4	41	45.4	48.9
Paraplast 06mm		6	19	16.1	29.5	32.7	35.2



## PROPERTIES



Parallel rope



Compacted



Parallel  
Construction



Lubricated



No Swivel



Tolerance

## APPLICATIONS

Very fatigue resistant and very high minimum breaking load. Hoist rope for electrical hoists and lifting devices with multiple part reeving, whereas a rotation resistant rope is not needed due to great lifting heights, low number of falls or guided loads.

## OVERVIEW

RCN	Diameter range [mm]	Number of outer strands	Number of wires	Number of outer load bearing wires	Average fill factor	Average weight factor	Average spin factor *N/mm <sup>2</sup>
08	6–8	8	303	200			
09	9–12	8	300	208	0,709	0,85	0,88 (1770)* 0,87 (1960)* 0,86 (2160)*
09	19–32	8	322	208			
09	33–50	8	362	208			

- Temperature range of use: –50°C to +115°C
- Suitable for multi-layer spooling
- Available in ordinary lay and Lang's lay
- Available in right hand and left hand
- Available in galvanized and ungalvanized

nominal diameter	metallic area	weight	calculated aggregate breaking force						minimum breaking force							
			1770 N/mm <sup>2</sup>		1960 N/mm <sup>2</sup>		2160 N/mm <sup>2</sup>		1770 N/mm <sup>2</sup>		1960 N/mm <sup>2</sup>		2160 N/mm <sup>2</sup>			
mm	mm <sup>2</sup>	kg/m	kN	t [metric]	kN	t [metric]	kN	t [metric]	kN	t [metric]	kN	t [metric]	kN	t [metric]	kN	t [metric]
6	19,0	0,16	33,6	3,42	37,2	3,79	41,0	4,18	29,5	3,01	32,7	3,34	35,2	3,59		
7	26,3	0,22	46,6	4,75	51,5	5,26	56,8	5,79	41,0	4,18	45,4	4,63	48,9	4,98		
8	34,8	0,30	61,6	6,28	68,2	6,95	75,1	7,66	54,2	5,52	60,0	6,12	64,6	6,59		
9	44,1	0,37	78,0	7,95	86,3	8,80	95,1	9,70	68,6	7,00	76,0	7,75	81,8	8,34		
10	54,2	0,46	96,0	9,79	106,3	10,84	117,1	11,94	84,5	8,61	93,5	9,54	100,7	10,27		
11	65,7	0,56	116,3	11,86	128,8	13,14	142,0	14,48	102,4	10,44	113,4	11,56	122,1	12,45		
12	79,6	0,68	140,8	14,36	155,9	15,90	171,8	17,52	123,9	12,64	137,2	13,99	147,8	15,07		
12,7	88,4	0,75	156,4	15,95	173,2	17,66	190,9	19,46	137,6	14,04	152,4	15,54	164,1	16,74		
13	92,6	0,79	163,9	16,71	181,5	18,51	200,0	20,39	144,2	14,71	159,7	16,28	172,0	17,54		
14	107,1	0,91	189,6	19,34	210,0	21,41	231,4	23,60	166,9	17,02	184,8	18,84	199,0	20,29		
15	123,1	1,05	217,8	22,21	241,2	24,60	265,8	27,11	191,7	19,55	212,3	21,64	228,6	23,31		
16	139,4	1,19	246,7	25,16	273,2	27,86	301,1	30,70	217,1	22,14	240,4	24,52	258,9	26,40		
17	158,5	1,35	280,5	28,60	310,6	31,67	342,3	34,90	246,8	25,17	273,3	27,87	294,4	30,02		
18	176,4	1,50	312,3	31,84	345,8	35,26	381,1	38,86	274,8	28,02	304,3	31,03	327,7	33,42		
19	198,3	1,69	351,0	35,79	388,7	39,64	428,3	43,68	308,9	31,50	342,0	34,88	368,4	37,56		
20	220,1	1,87	389,6	39,73	431,4	43,99	475,5	48,48	342,9	34,96	379,7	38,71	408,9	41,70		
21	240,4	2,04	425,5	43,39	471,2	48,05	519,3	52,95	374,5	38,18	414,7	42,28	446,6	45,54		
22	264,8	2,25	468,7	47,80	519,1	52,93	572,0	58,33	412,5	42,06	456,8	46,58	491,9	50,16		
23	299,8	2,55	530,7	54,11	587,6	59,92	647,6	66,04	467,0	47,62	517,1	52,73	556,9	56,79		
24	325,7	2,77	576,5	58,79	638,4	65,10	703,5	71,74	507,3	51,73	561,8	57,29	605,0	61,70		
25	353,1	3,00	625,0	63,73	692,1	70,57	762,7	77,77	550,0	56,08	609,0	62,10	655,9	66,89		
26	383,9	3,26	679,5	69,29	752,4	76,73	829,2	84,56	598,0	60,98	662,2	67,52	713,1	72,72		
27	412,3	3,50	729,7	74,41	808,0	82,39	890,6	90,80	642,1	65,48	711,0	72,51	765,8	78,09		
28	441,0	3,75	780,5	79,59	864,3	88,13	952,5	97,12	686,8	70,04	760,6	77,55	819,1	83,53		
29	475,6	4,04	841,8	85,84	932,2	95,06	1027,3	104,76	740,8	75,54	820,3	83,65	883,5	90,09		
30	512,5	4,36	907,1	92,50	1004,5	102,43	1107,0	112,88	798,3	81,40	884,0	90,14	952,0	97,08		
31	546,6	4,65	967,5	98,66	1071,4	109,25	1180,7	120,40	841,7	85,83	921,4	93,95	1003,6	102,34		
32	580,4	4,93	1027,3	104,75	1137,5	116,00	1253,6	127,83	893,7	91,13	978,3	99,76	1065,6	108,66		
33	618,5	5,26	1094,7	111,63	1212,3	123,62	1336,0	136,23	952,4	97,12	1042,5	106,31	1135,6	115,80		
34	650,8	5,53	1151,9	117,46	1275,6	130,07	1405,7	143,34	1002,2	102,19	1097,0	111,86	1194,9	121,84		
35	690,5	5,87	1222,1	124,62	1353,3	138,00	1491,4	152,08	1063,3	108,42	1163,9	118,68	1267,7	129,27		
36	732,0	6,22	1295,6	132,12	1434,7	146,30	1581,1	161,23	1127,2	114,94	1233,8	125,82	1343,9	137,04		
37	770,8	6,55	1364,3	139,12	1510,7	154,05	1664,9	169,77	1186,9	121,03	1299,2	132,49	1415,2	144,31		
38	817,0	6,95	1446,1	147,47	1601,4	163,30	1764,8	179,96	1258,1	128,30	1377,2	140,43	1500,1	152,96		
39	851,5	7,24	1507,2	153,69	1669,0	170,19	1839,3	187,56	1311,3	133,71	1435,3	146,36	1563,4	159,42		
40	909,7	7,73	1610,2	164,20	1783,1	181,82	1965,0	200,38	1400,9	142,85	1533,5	156,37	1670,3	170,32		
42	996,8	8,47	1764,3	179,90	1953,6	199,22	2153,0	219,55	1534,9	156,52	1680,1	171,33	1830,1	186,61		
44	1098,4	9,34	1944,1	198,24	2152,8	219,53	2372,5	241,93	1691,4	172,47	1851,4	188,79	2016,6	205,64		
46	1200,0	10,20	2124,1	216,59	2352,1	239,84	2592,1	264,32	1847,9	188,44	2022,8	206,27	2203,3	224,67		
48	1306,4	11,10	2312,3	235,79	2560,5	261,10	2821,8	287,74	2011,7	205,13	2202,0	224,54	2398,5	244,58		
50	1403,3	11,93	2483,8	253,27	2750,4	280,46	3031,0	309,08	2160,9	220,35	2365,3	241,20	2576,4	262,72		

Special constructions and diameters available - please contact us directly.



## Superplast 8

Boom hoist rope for mobile cranes and grabs, hoist rope for container cranes, floating cranes, portal cranes, etc. and for various offshore applications. In multiple part reeving for smaller lifting heights, twin hoist systems with left and right hand ropes for greater lifting heights, where rotation resistant ropes are not required.

Is a 10 strand rope made out of compacted outer strands.

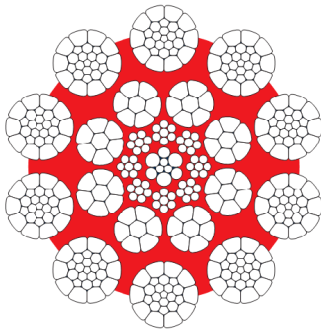
Is fully lubricated.

Has a plastic layer between the steel core and the outer strands giving the rope a high structural stability. The plastic layer also assists in avoiding internal rope destruction and protecting the core against corrosive environments.

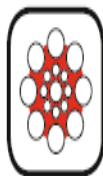
Has a very high breaking load and good resistance against drum crushing.

Superplast 8 should NOT be used with a swivel.

Regular Lay or Langs Lay.



## PROPERTIES



Plast rope



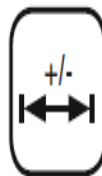
Compacted



Lubricated



No Swivel



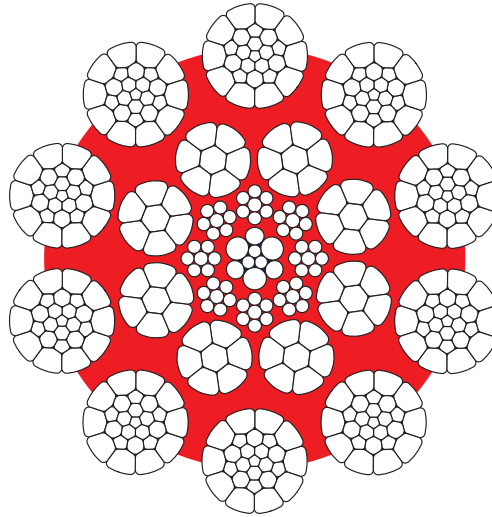
Tolerance

## Product Specifications

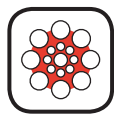
Name	ITEM #	Diameter	Metallic Area (mm <sup>2</sup> )	Approximate Mass (kg/100m)	Grade 1770 MBF (kN)	Grade 1960 MBF (kN)	Grade 2160 MBF (kN)
Superplast 8, 44mm		44	1038.3	892.9	1567.8	1725.8	1890.7
Superplast 8, 42mm		42	949.8	816.8	1436.7	1581.5	1732.6
Superplast 8, 40mm		40	861.9	741.2	1298.3	1429.3	1565.8
Superplast 8, 38mm		38	774.3	665.9	1165.1	1282.5	1405
Superplast 8, 36mm		36	704.1	605.5	1065.1	1172.5	1284.5
Superplast 8, 34mm		34	630.2	542	950.2	1046	1145.9
Superplast 8, 32mm		32	560.3	481.8	841	925.9	1014.3
Superplast 8, 30mm		30	480.5	413.2	723.8	796.8	872.9
Superplast 8, 28mm		28	420.3	361.4	631.1	698.9	762
Superplast 8, 26mm		26	363.7	312.8	549.5	604.9	662.7
Superplast 8, 24mm		24	312.2	268.5	470	517.4	566.9
Superplast 8, 22mm		22	260	223.6	392.6	432.2	473.5
Superplast 8, 20mm		20	215.4	185.3	326.5	358.2	394.8

Superplast 8, 18mm	18	176	151.4	266	292.8	320.8
Superplast 8, 16mm	16	137	117.8	205.7	226.5	248.1

Uncontrolled version printed 07-Mar-2018 .See [www.nobles.com.au](http://www.nobles.com.au) for latest up-to-date product information.



## PROPERTIES



Plast rope



Compacted



Lubricated



No Swivel



Tolerance

## APPLICATIONS

Very high breaking load and good resistance against drum crushing. Hoisting rope in multiple part reeving for smaller lifting heights as well as for twin hoist systems with left and right hand lay ropes for greater lifting heights.

## OVERVIEW

RCN	Diameter range [mm]	Number of outer strands	Number of wires	Number of outer load bearing wires	Average fill factor	Average weight factor	Average spin factor *N/mm <sup>2</sup>
11	10–67	10	381	260	0,686	0,86	0,85 (1770, 1960)*
>13	68–76	10	519	310			0,84 (2160)*

- Temperature range of use: –50°C to +115°C
- Suitable for multi-layer spooling
- Available in ordinary lay and Lang's lay
- Available in right hand and left hand
- Available in galvanized and ungalvanized



nominal diameter	metallic area	weight	calculated aggregate breaking force						minimum breaking force							
			1770 N/mm <sup>2</sup>		1960 N/mm <sup>2</sup>		2160 N/mm <sup>2</sup>		1770 N/mm <sup>2</sup>		1960 N/mm <sup>2</sup>		2160 N/mm <sup>2</sup>			
mm	mm <sup>2</sup>	kg/m	kN	t [metric]	kN	t [metric]	kN	t [metric]	kN	t [metric]	kN	t [metric]	kN	t [metric]	kN	t [metric]
10	54,6	0,47	96,6	9,85	107,0	10,91	117,9	12,02	82,6	8,42	90,9	9,27	99,6	10,15		
11	65,9	0,57	116,6	11,89	129,2	13,17	142,3	14,52	98,9	10,09	108,9	11,10	119,3	12,16		
12	77,0	0,66	136,3	13,90	151,0	15,40	166,4	16,97	115,6	11,79	127,2	12,97	139,4	14,21		
12,7	86,9	0,75	153,8	15,68	170,3	17,36	187,6	19,13	131,0	13,36	144,2	14,71	158,0	16,11		
13	90,9	0,78	160,9	16,41	178,2	18,17	196,4	20,03	137,9	14,06	151,8	15,47	166,2	16,95		
14	103,9	0,89	183,9	18,75	203,6	20,76	224,4	22,88	157,9	16,10	173,8	17,72	190,4	19,42		
15	119,8	1,03	212,0	21,62	234,7	23,94	258,7	26,38	181,5	18,51	199,8	20,37	218,9	22,32		
16	137,0	1,18	242,5	24,73	268,6	27,39	296,0	30,18	205,7	20,98	226,5	23,09	248,1	25,30		
17	156,6	1,35	277,2	28,27	307,0	31,30	338,3	34,50	236,2	24,08	260,0	26,51	284,8	29,04		
18	176,0	1,51	311,6	31,77	345,0	35,18	380,2	38,77	266,0	27,12	292,8	29,86	320,8	32,71		
19	194,0	1,67	343,4	35,01	380,2	38,77	419,0	42,73	291,0	29,68	320,4	32,67	351,0	35,79		
20	215,4	1,85	381,3	38,88	422,2	43,05	465,3	47,45	326,5	33,29	358,2	36,65	394,8	40,15		
21	237,7	2,04	420,7	42,90	465,8	47,50	513,4	52,35	360,4	36,75	396,8	40,46	434,7	44,32		
22	260,0	2,24	460,3	46,93	509,7	51,97	561,7	57,27	392,6	40,04	432,2	44,07	473,5	48,28		
23	286,4	2,46	507,0	51,70	561,4	57,24	618,7	63,09	429,7	43,82	473,0	48,23	518,2	52,84		
24	312,2	2,69	552,5	56,34	611,8	62,39	674,3	68,76	470,0	47,93	517,4	52,76	566,9	57,80		
25	336,5	2,89	595,6	60,73	659,5	67,25	726,8	74,11	505,4	51,53	559,6	57,06	613,4	62,55		
26	363,7	3,13	643,8	65,65	712,9	72,69	785,6	80,11	549,5	56,04	604,9	61,69	662,7	67,58		
27	390,7	3,36	691,5	70,52	765,8	78,09	843,9	86,06	587,6	59,92	646,8	65,96	708,6	72,26		
28	420,3	3,61	743,8	75,85	823,7	83,99	907,7	92,56	631,1	66,52	698,9	71,27	762,0	77,70		
29	445,8	3,83	789,1	80,46	873,8	89,10	962,9	98,19	670,2	68,34	737,8	75,23	808,3	82,42		
30	480,5	4,13	850,5	86,72	941,7	96,03	1037,8	105,83	723,8	73,81	796,8	81,25	872,9	89,01		
31	509,3	4,38	901,5	91,93	998,3	101,80	1100,2	112,19	769,1	78,43	846,7	86,34	927,5	94,58		
32	560,3	4,82	991,7	101,12	1098,1	111,98	1210,2	123,40	841,0	85,76	925,9	94,41	1014,3	103,43		
33	585,1	5,03	1035,6	105,60	1146,8	116,94	1263,8	128,87	879,7	89,71	968,4	98,75	1060,9	108,19		
34	630,2	5,42	1115,4	113,74	1235,2	125,95	1361,2	138,80	950,2	96,89	1046,0	106,66	1145,9	116,85		
36	704,1	6,06	1246,2	127,08	1380,0	140,72	1520,8	155,08	1065,1	108,61	1172,5	119,56	1284,5	130,98		
38	774,3	6,66	1370,6	139,76	1517,7	154,76	1672,5	170,55	1165,1	118,80	1282,5	130,78	1405,0	143,27		
40	861,9	7,41	1525,5	155,56	1689,3	172,26	1861,7	189,84	1298,3	132,39	1429,3	145,74	1565,8	159,67		
42	949,8	8,17	1681,2	171,43	1861,6	189,83	2051,6	209,20	1436,7	146,50	1581,5	161,27	1732,6	176,67		
44	1038,3	8,93	1837,7	187,40	2035,0	207,51	2242,7	228,69	1567,8	159,87	1725,8	175,99	1890,7	192,80		
46	1150,9	9,90	2037,2	207,73	2255,8	230,03	2486,0	253,51	1725,3	175,93	1899,3	193,67	2080,7	212,17		
48	1249,9	10,75	2212,4	225,60	2449,9	249,82	2699,9	275,31	1879,4	191,65	2068,9	210,97	2266,6	231,13		
50	1342,9	11,55	2377,0	242,39	2632,2	268,41	2900,8	295,80	2027,8	206,78	2232,3	227,63	2445,5	249,38		
52	1455,2	12,51	2575,6	262,64	2852,1	290,83	3143,1	320,51	2199,5	224,29	2421,3	246,91	2652,6	270,49		
54	1582,1	13,61	2800,4	285,56	3100,0	316,21	3417,4	348,48	2386,0	243,30	2626,5	267,83	2877,4	293,42		
56	1713,1	14,73	3032,1	309,19	3357,6	342,38	3700,2	377,32	2592,1	264,32	2853,4	290,97	3126,0	318,76		
58	1812,2	15,59	3207,6	327,09	3551,9	362,20	3914,4	399,16	2729,1	278,30	3004,3	306,36	3291,3	335,62		
60	1952,4	16,79	3455,8	352,39	3826,8	390,22	4217,3	430,04	2947,8	300,59	3245,0	330,90	3555,0	362,51		
62	2070,4	17,81	3664,6	373,68	4057,9	413,79	4472,0	456,02	3117,7	317,92	3432,1	349,98	3759,9	383,41		
64	2189,3	18,83	3875,0	395,14	4291,0	437,56	4728,8	482,21	3312,7	337,80	3646,8	371,87	3995,1	407,39		
66	2346,1	20,18	4152,7	423,45	4598,4	468,91	5067,7	516,76	3521,7	359,11	3876,8	395,32	4247,1	433,08		
68	2474,6	21,53	4380,0	446,64	4850,2	494,59	5345,1	545,06	3769,7	384,41	4147,3	422,91	4600,3	469,10		
70	2645,4	23,02	4682,3	477,46	5184,9	528,72	5714,0	582,67	4029,8	410,93	4462,4	455,04	4917,7	501,47		
72	2793,9	24,31	4945,2	504,28	5476,1	558,41	6034,9	615,39	4256,1	434,01	4713,0	480,60	5193,9	529,64		
74	2952,6	25,69	5226,1	532,92	5787,1	590,12	6377,6	650,34	4497,8	458,65	4980,6	507,89	5488,9	559,72		
76	3098,2	26,95	5483,8	559,20	6072,5	619,23	6692,2	682,42	4719,7	481,28	5226,3	532,94	5759,6	587,32		

Special constructions and diameters available - please contact us directly.

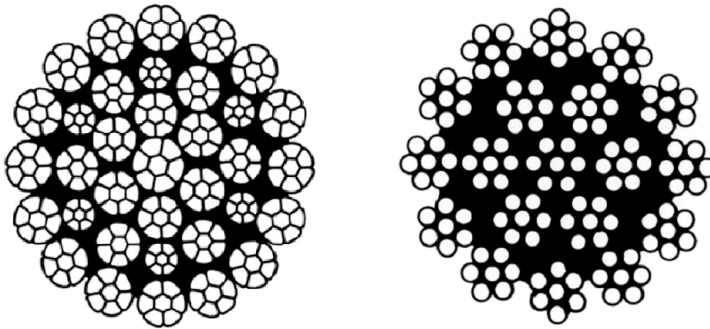
## 1.3 Value Crane Wire Ropes



## Rotation-Resistant Wire Ropes

Nobles Rotation-Resistant wire ropes are available in 6 - 22mm. The ropes from 6 -12mm are the 19x7 construction and our standard ropes are galvanised 1960 grade and come in Right Hand Ordinary Lay.

Rotation-Resistant wire ropes from 13 - 22mm are in the 35x7 construction and are compacted for maximum breaking loads. This range is ungalvanised and comes in Right Hand Langs Lay as standard which is ideal for multi layer applications such as winches on mobile cranes.



## Product Specifications

<b>Name</b>	<b>ITEM #</b>	<b>MBL (kN)</b>	<b>Mass (kg/m)</b>
R/R Wire Rope 6mm 19X7 B 1960	15759	23.1	0.15
R/R Wire Rope 7mm 19X7 B 1960	14385	31.5	0.197
R/R Wire Rope 8mm 19X7 B 1960	13838	41.1	0.269
R/R Wire Rope 10mm 19X7 B 1960	12725	64.3	0.421
R/R Wire Rope 11mm 19x7 B 1960	24599	77.8	0.563
R/R Wire Rope 13mm 35X7 U 1960 Compacted	19369	154	0.87
R/R Wire Rope 14mm 35X7 U 1960 zZ Compacted	18070	179.5	1
R/R Wire Rope 16mm 35X7 U 1960 zZ Compacted	16117	234.4	1.32
R/R Wire Rope 18mm 35X7 U 1960 Compacted	14377	301	1.67
R/R Wire Rope 20mm 35X7 U 1960 Compacted	11509	372	2.06
R/R Wire Rope 22mm 35X7 U 1960 zZ Compacted	10222	443.8	2.47



**OLIVEIRA**  
A WireCo® WorldGroup Brand

## NR Maxipact

37 x 7 (18 outer compacted strands)

High Performance Rotation resistant rope with fully compacted strands.

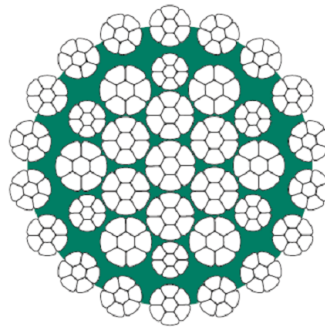
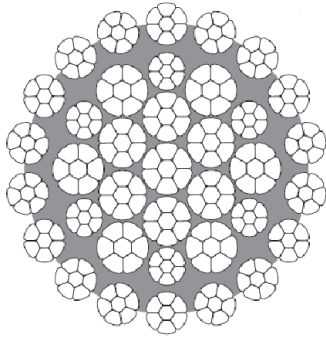
Very flexible

Available in Lang's Lay only

Can be used with a swivel

Can be used in single fall configuration

Also available with a Plastic Protected Impregnated core (PPI)



## Product Specifications

Name	ITEM #	Diameter (mm)	Construction	Metallic Area (mm <sup>2</sup> )	Approximate Mass (kg/100m)	Grade 1960 MBF (kN)	Grade 2160 MBF (kN)
NR Maxipact 36mm		36	37 x 7	732	633	1221	1281
NR Maxipact 34mm		34	37 x 7	647	559	1079	1132
NR Maxipact 32mm		32	37 x 7	575	497	959	1006
NR Maxipact 30mm		30	37 x 7	507	438	846	887
NR Maxipact 28mm		28	34 x 7	436	377	728	763
NR Maxipact 27mm		27	34 x 7	407	352	679	712
NR Maxipact 26mm		26	34 x 7	379	327	632	663
NR Maxipact 25mm		25	34 x 7	353	306	581	617
NR Maxipact 24mm		24	34 x 7	320	277	534	560
NR Maxipact 23mm		23	34 x 7	295	255	492	516
NR Maxipact 22mm		22	34 x 7	267	231	446	467
NR Maxipact 21mm		21	34 x 7	247	214	412	432

NR Maxipact 20mm	20	34 x 7	220	190	367	385
NR Maxipact 19mm	19	34 x 7	198	171	330	347
NR Maxipact 18mm	18	34 x 7	178	154	297	311
NR Maxipact 17mm	17	34 x 7	160	139	267	280
NR Maxipact 16mm	16	34 x 7	143	124	239	250
NR Maxipact 15mm	15	34 x 7	124	107	207	217
NR Maxipact 14mm	14	34 x 7	109	94	182	191
NR Maxipact 13mm	13	34 x 7	94	81	156	164

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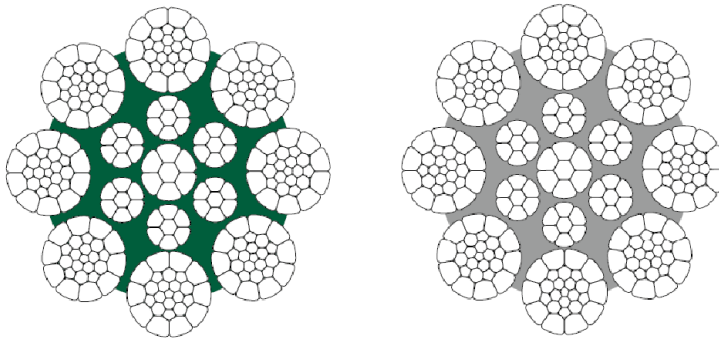




**OLIVEIRA**  
A WireCo® WorldGroup Brand

## HD8K

When rotation resistant ropes are not required (twin hoist systems with right and left ropes, small heights). Hoist for steel mill cranes, container cranes, floating cranes and boom hoist for deck cranes, luffing and mobile cranes, grab cranes.



## Product Specifications

Name	ITEM #	Diameter (mm)	Construction	Metallic Area (mm <sup>2</sup> )	Approximate Mass (kg/100m)	Grade 1960 MBF (kN)	Grade 2160 MBF (kN)
HD8K, 32mm		32	8 x 31	549	475	916	961
HD8K, 30mm		30	8 x 31	479	416	800	859
HD8K, 28mm		28	8 x 26	415	358	692	725
HD8K, 26mm		26	8 x 26	359	310	600	629
HD8K, 24mm		24	8 x 26	359	310	600	629
HD8K, 22mm		22	8 x 26	257	223	430	451
HD8K, 20mm		20	8 x 26	214	185	358	375
HD8K, 19mm		19	8 x 26	191	165	318	334
HD8K, 18mm		18	8 x 26	172	149	287	300
HD8K, 16mm		16	8 x 17	134	116	224	234
HD8K, 15mm		15	8 x 17	120	103	200	210
HD8K, 14mm		14	8 x 17	103	89	172	180

HD8K, 13mm	13	8 x 17	90	77	150	157
HD8K, 12mm	12	8 x 17	75	65	125	131
HD8K, 11mm	11	8 x 12	64	55	0	112
HD8K, 10mm	10	8 x 12	53	45	0	92.4
HD8K, 09mm	9	8 x 12	42	36	0	73.6
HD8K, 08mm	8	8 x 12	33	29	0	58

Uncontrolled version printed 07-Mar-2018 .See [www.nobles.com.au](http://www.nobles.com.au) for latest up-to-date product information.

## NAVIGATION

// ROTATION-RESISTANT

// SEMI-ROTATION-RESISTANT

// NON-ROTATION-RESISTANT

**HD 8 K (Option PPI)**

HD 9 K (Option PPI)

SC 6 K

SC 8 C (Option PPI)

DP 8 K (Option PPI)

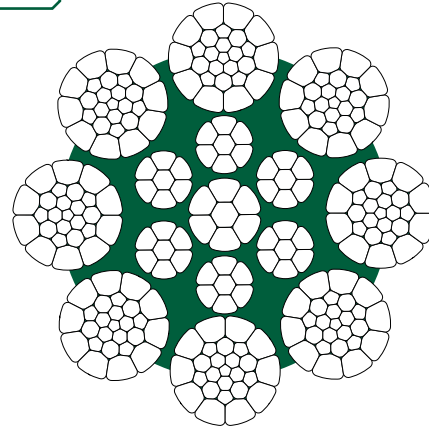
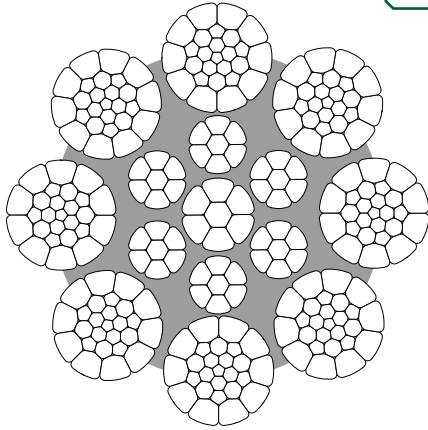
DP 10 K

LP 5

## OLIVEIRA HD 8 K

## OLIVEIRA HD 8 K PPI

IMPROVED  
DESIGN



## PROPERTIES



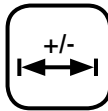
No Swivel



Compacted

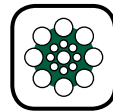


Lubricated



Tolerance

+



PPI

## APPLICATIONS

When rotation resistant ropes are not required (twin hoist systems with right and left ropes, small heights). Hoist for steel mill cranes, container cranes, floating cranes and boom hoist for deck cranes, luffing and mobile cranes, grab cranes

## OVERVIEW

RCN	Diameter range [mm]	Construction	Number of outer strands	Number of wires	Number of outer load bearing wires	Average fill factor	Average spin factor
03	8 – 11	8xK12	8	145	96	0,672	
03	12 – 14	8xK17	8	185	136	0,675	0,850 (1770 N/mm <sup>2</sup> )
09	15 – 28	8xK26	8	257	208	0,677	0,850 (1960 N/mm <sup>2</sup> )
11	30 – 42	8xK31	8	297	248	0,673	0,820 (2160 N/mm <sup>2</sup> )
13	44 – 60	8xK36	8	407	288	0,683	

- Temperature range of use: -50°C to +100°C
- Temperature range of use for option PPI: -50°C to +80°C
- Option PPI – only available for diameter ≥ 13mm
- Please add 1.5% on the weight for ropes with PPI
- Available in ordinary lay and Lang's lay
- Available in right hand and left hand

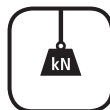
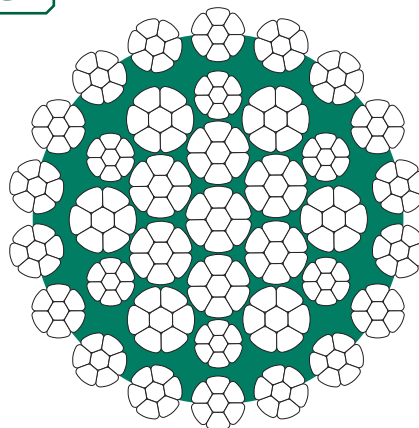
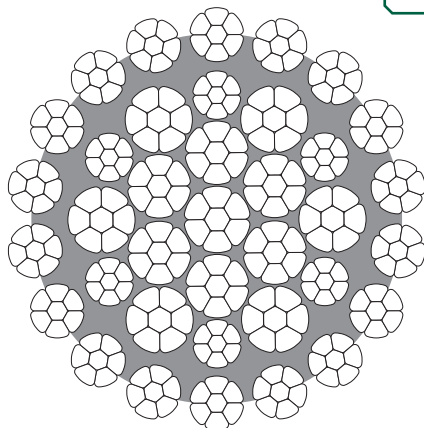
nominal diameter	metallic area	weight	calculated aggregate breaking force						minimum breaking force							
			1770 N/mm <sup>2</sup>		1960 N/mm <sup>2</sup>		2160 N/mm <sup>2</sup>		1770 N/mm <sup>2</sup>		1960 N/mm <sup>2</sup>		2160 N/mm <sup>2</sup>			
mm	mm <sup>2</sup>	kg/m	kN	t [metric]	kN	t [metric]	kN	t [metric]	kN	t [metric]	kN	t [metric]	kN	t [metric]	kN	t [metric]
8	32,9	0,284					71,2	7,26							58,0	5,91
9	42,2	0,362					91,1	9,29							73,6	7,50
10	53,3	0,458					115	11,74							92,4	9,42
11	65,8	0,565					139	14,16							112	11,42
12	75,8	0,649	134	14,32	148	15,14	164	16,69	115	11,88	126	12,89	133	13,52		
13	89,3	0,769	158	16,88	175	17,85	193	19,67	137	14,00	149	15,19	156	15,93		
14	105	0,903	186	18,97	206	21,01	227	23,15	158	16,10	175	17,82	187	19,07		
15	119	1,026	211	21,54	234	23,86	258	26,29	180	18,35	203	20,67	214	21,82		
16	135	1,160	238	24,29	264	26,90	291	29,65	204	20,80	229	23,39	242	24,72		
18	174	1,494	307	31,32	340	34,68	375	38,22	260	26,53	288	29,39	307	31,31		
19	191	1,641	338	34,42	374	38,12	412	42,00	292	29,79	324	32,99	342	34,87		
20	214	1,836	378	38,57	419	42,71	462	47,06	321	32,73	356	36,25	379	38,65		
22	258	2,215	457	46,55	506	51,55	557	56,81	392	39,94	434	44,23	459	46,75		
24	307	2,635	543	55,40	602	61,35	663	67,61	465	47,37	514	52,44	556	56,70		
25	333	2,859	590	60,12	653	66,58	720	73,37	504	51,41	558	56,92	602	61,39		
26	362	3,106	641	65,35	710	72,37	782	79,75	549	55,97	608	61,98	655	66,79		
28	416	3,571	735	75,00	814	83,05	898	91,52	630	64,20	697	71,10	748	76,27		
30	479	4,116	847	86,38	938	95,66	1034	105,42	727	74,14	803	81,88	864	88,10		
32	544	4,672	962	98,13	1066	108,66	1174	119,75	828	84,43	911	92,90	968	98,71		
34	616	5,294	1090	111,16	1207	123,09	1330	135,65	936	95,49	1025	104,51	1091	111,25		
36	680	5,842	1204	122,74	1333	135,91	1469	149,78	1040	106,06	1150	117,27	1217	124,10		
38	762	6,579	1348	145,77	1493	152,21	1645	167,75	1159	120,99	1271	129,56	1332	135,88		
40	845	7,298	1496	161,83	1656	168,90	1825	186,14	1286	134,32	1410	143,76	1479	150,77		
42	922	7,978	1632	176,56	1807	184,30	1992	203,10	1404	146,55	1538	156,87	1613	164,51		
44	1040	9,001	1841	171,03	2039	207,93	2247	229,15	1554	141,95	1736	176,98	1820	185,61		
46	1129	9,780	1998	216,98	2212	225,61	2438	248,63	1713	180,09	1883	192,03	1975	201,39		
48	1232	10,61	2181	236,82	2415	246,23	2661	271,36	1859	196,56	2055	209,58	2155	219,80		
50	1350	11,69	2390	259,67	2647	269,90	2917	297,44	1986	215,53	2253	229,73	2363	240,93		
52	1455	12,51	2575	279,67	2851	290,75	3142	320,42	2147	232,13	2427	247,48	2545	259,54		
54	1563	13,54	2766	300,35	3063	312,32	3375	344,19	2316	249,29	2607	265,84	2734	278,79		
56	1681	14,59	2976	323,16	3295	336,04	3632	370,33	2480	268,22	2805	286,03	2942	299,97		
58	1811	15,69	3205	348,06	3549	361,90	3911	398,83	2650	288,89	3021	308,04	3168	323,06		
60	1932	16,71	3421	371,40	3788	386,24	4174	425,65	2842	308,26	3224	328,75	3381	344,77		

Special constructions and diameters available - please contact us directly.

# OLIVEIRA NR MAXIPACT

# OLIVEIRA NR MAXIPACT PPI

IMPROVED  
DESIGN



High  
breaking force



High  
breaking force

## PROPERTIES



Swivel



Lubricated



PPI



Compacted



Swivel



Lubricated

## APPLICATIONS

Main and auxiliary hoists where superior rotation resistant properties and superior minimum breaking forces (MBF) are required.

Recommend in marine and other severe working environments.

## OVERVIEW

Diameter range [mm]	Construction	Number of outer strands	Number of wires	Number of outer load bearing wires	Average fill factor	Average spin factor
12.7 – 54	37xK7	18	259	126	0,716	0,85 (1960 N/mm <sup>2</sup> ) 0,81 (2160 N/mm <sup>2</sup> )

- Tolerance on diameter: (EN: +0%; +5%)
- Temperature range of use: -50°C to +100°C
- Temperature range of use for option PPI: -50°C to +80°C
- Option PPI – only available for diameter ≥ 13mm
- Available in ordinary lay and Lang’s lay
- Available in right hand and left hand
- Available in galvanized and ungalvanized

nominal diameter	metallic area	weight	calculated aggregate breaking force				minimum breaking force				
			1960 N/mm <sup>2</sup>		2160 N/mm <sup>2</sup>		1960 N/mm <sup>2</sup>		2160 N/mm <sup>2</sup>		
			kN	t [metric]	kN	t [metric]	kN	t [metric]	kN	t [metric]	
mm	mm <sup>2</sup>	kg/m									
13	94,7	0,816	185,6	18,9	204,6	20,9	157,8	16,1	165,7	16,9	
14	110,0	0,949	215,6	22,0	237,6	24,2	183,3	18,7	192,5	19,6	
15	125,8	1,088	246,6	25,1	271,7	27,7	209,6	21,4	220,6	22,5	
16	143,7	1,245	281,7	28,7	310,4	31,7	239,4	24,4	251,4	25,6	
17	161,9	1,398	317,3	32,4	349,7	35,7	269,7	27,5	283,4	28,9	
18	181,6	1,562	355,9	36,3	392,3	40,0	302,5	30,9	317,7	32,4	
19	203,4	1,757	398,7	40,7	439,3	44,8	338,9	34,6	355,9	36,3	
20	224,6	1,930	440,2	44,9	485,1	49,5	374,2	38,2	393,0	40,1	
21	247,4	2,139	484,9	49,4	534,4	54,5	412,2	42,0	432,9	44,1	
22	271,3	2,342	531,7	54,2	586,0	59,8	452,0	46,1	474,7	48,4	
23	297,0	2,560	582,1	59,4	641,5	65,4	494,8	50,5	519,6	53,0	
24	324,3	2,790	635,6	64,8	700,5	71,4	540,3	55,1	567,4	57,9	
25	352,4	3,043	690,7	70,4	761,2	77,6	587,1	59,9	616,6	62,9	
26	380,7	3,270	746,2	76,1	822,3	83,9	634,2	64,7	666,1	67,9	
27	410,3	3,544	804,2	82,0	886,2	90,4	683,6	69,7	717,9	73,2	
28	440,6	3,802	863,6	88,1	951,7	97,0	734,0	74,9	770,9	78,6	
30	508,0	4,391	995,7	101,5	1097,3	111,9	846,3	86,3	888,8	90,6	
32	576,0	4,977	1129,0	115,1	1244,2	126,9	959,6	97,9	1007,8	103	
34	647,1	5,586	1268,3	129,3	1397,7	142,5	1079,3	110	1133,0	116	
36	733,2	6,314	1437,1	146,5	1583,7	161,5	1221,5	125	1282,8	131	
38	810,7	7,014	1589,0	162,0	1751,1	178,6	1352,4	138	1418,4	145	
40	896,0	7,744	1756,2	179,1	1935,4	197,4	1495,0	152	1569,0	160	
42	987,5	8,519	1935,5	197,4	2133,0	217,5	1645,2	168	1730,0	176	
44	1091,6	9,400	2139,5	218,2	2357,9	240,4	1818,6	185	1909,9	195	
46	1198	10,374	2347,9	239,4	2587,5	263,8	1995,7	204	2095,8	214	
48	1311	11,320	2569,8	262,0	2832,0	288,8	2184,3	223	2293,9	234	
50	1400	12,042	2743,2	279,7	3023,1	308,3	2331,7	238	2451,2	250	
52	1529,7	13,226	2998,2	305,7	3304,2	336,9	2548,8	260	2676,4	273	
54	1639,4	14,128	3213,2	327,7	3541,1	361,1	2731,2	279	2868,3	292	

Special constructions and diameters available - please contact us directly.

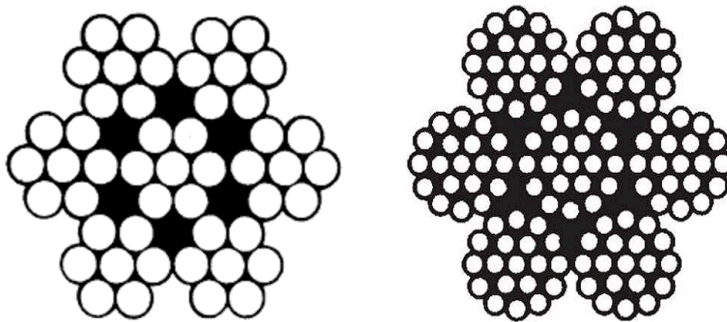
## 1.4 Other Wire Rope & Strands





## Small General Purpose Wire Ropes

Nobles stock galvanised small cord wire rope in sizes from 1.5mm to 6mm. These wire ropes feature a Wire Strand Core (WSC) in sizes 1.5 to 6mm with the 7mm having an Independent Wire Rope Core (IWRC). The WSC and IWRC increase breaking load and reduce drum crushing in multi-layer applications. The 3mm to 7mm wire ropes come in high tensile 2070 grade as standard



## Product Specifications

Name	ITEM #	MBL (kN)	Mass (kg/m)
Wire Rope 7mm 6X19 IWRC B 2070	19132	33.7	0.187
Wire Rope 6mm 7X19 sZ WSC B 2070	13333	25.5	0.137
Wire Rope 5mm 7X19 WSC B 2070	16275	11.21	0.095
Wire Rope 4mm 7X19 WSC B 2070	18484	7.03	0.061
Wire Rope 3mm 7X7 WSC B 2070	15591	4.6	0.035
Wire Rope 2mm 7X7 sZ WSC B 1570	12281	2.3	0.015
Wire Rope 1.5mm 7X7 WSC B 1570	14597	1.48	0.009



## PVC Coated General Purpose Wire Ropes

Nobles stock PVC coated wire rope in the specifications as listed below. Nobles PVC wire ropes have a fibre core and come in Blue Colour PVC as standard. Other colours and constructions are available at indent lead times but Minimum Order Quantities do apply.



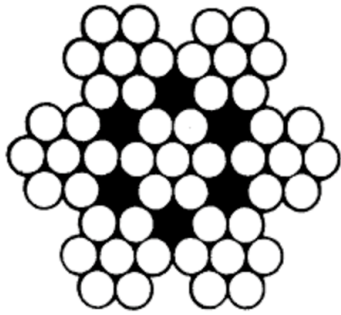
### Product Specifications

Name	ITEM #	MBL (kN)	Mass (kg/m)
Wire Rope 6mm 6X19 sZ B 1570 PVC - Blue Outside Diameter 8mm	16340	17.6	0.16
Wire Rope 5mm 6X19 sZ B 1570 PVC - Blue UV	12255	12	0.12
Wire Rope 4mm 6X19 sZ B 1570 PVC - Blue Outside Diameter 6mm	13373	7.7	0.8
Wire Rope 3mm 6X7 sZ B PVC Blue 1570 4mm Outside Diameter	11019	4.7	0.04



## Travelling Irrigator Wire Ropes

Nobles stock 7x7 WSC wire rope from 4mm to 10mm. The robust 7x7 construction is ideal for use with Travelling Irrigators and is used extensively in agriculture. 7x7 wire ropes are also ideal for fixed rigging applications such as guy ropes.



## Product Specifications

<b>Name</b>	<b>ITEM #</b>	<b>MBL (kN)</b>	<b>Mass (kg/m)</b>
Wire Rope 4mm 7x7 WSC 2070 B	21357	11.87	0.061
Wire Rope 5mm 7X7 WSC B 2070	17447	18.59	0.096
Wire Rope 6mm 7X7 WSC B 2070	15548	26.72	0.138
Wire Rope 7mm 7X7 WSC B 2070	11701	36.44	0.188
Wire Rope 8mm 7X7 WSC B 2070	11111	47.53	0.246
Wire Rope 9mm 7X7 WSC B 2070	14996	60.2	0.311
Wire Rope 10mm 7X7 WSC B 2070	11748	74.35	0.384

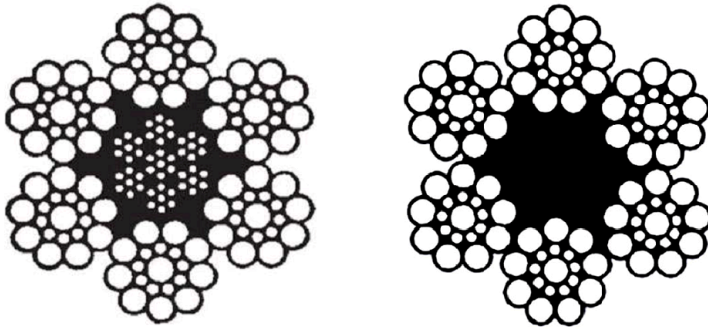


## Commercial Fishing Wire Ropes

Kiswire fishing ropes are available in both A & B galvanising and ALUMAR. ALUMAR fishing ropes have 5% aluminium in the zinc galvanising mix with the inclusion of the aluminium ensuring superior resistance to corrosion and a longer working life.

ALUMAR ropes have performed extremely well in laboratory Salt Spray (NaCl) and SO<sub>2</sub> Atmosphere humidity tests.

These tests indicate that ALUMAR technology improves corrosion resistance by approximately 3 times. ALUMAR fishing ropes are the end product of many years of testing in regard to the correct level of aluminium to be included in the zinc mix. The level of 5% provides the optimum balance of corrosion resistance, durability and working life.



# Product Specifications

<b>Name</b>	<b>ITEM #</b>	<b>MBL (kN)</b>	<b>Mass (kg/m)</b>
Fishing Wire Rope 12mm 6X19S IWRC sZ B 1770 C&D	12540	90.7	0.576
Fishing Wire Rope 12mm 6X19S SFC sZ A 1770 Onesteel	17878	84.1	0.517
Fishing Wire Rope 12mm 6X19S SFC sZ B 1570 C&D	16410	74.6	0.517
Fishing Wire Rope 14mm 6X19S IWRC sZ B 1770 C&D	10705	124	0.784
Fishing Wire Rope 14mm 6X19S SFC sZ A 1770 Onesteel	16103	114	0.704
Fishing Wire Rope 14mm 6X19S SFC sZ B 1570 C&D	15261	101	0.704
Fishing Wire Rope 16mm 6X19S IWRC sZ B 1570 PVC - Black Uv Resistant	18590	143	1.02
Fishing Wire Rope 16mm 6X19S IWRC sZ B 1770 C&D	12498	161	1.02
Fishing Wire Rope 16mm 6X19S SFC sZ A 1770	11718	150	0.919
Fishing Wire Rope 16mm 6X19S SFC sZ B 1570 C&D	18678	133	0.919



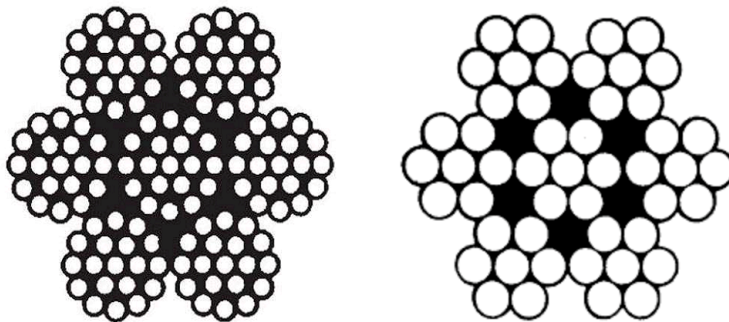
## Stainless Steel Wire Ropes

Nobles stock a range of stainless steel wire ropes as per the below table. 7x19 is available from 2 to 12mm diameter with 316 grade being preferred. 304 Grade is also available in the common sizes however. 7x7 is available in 1.6, 2, 3 and 4mm. 1x19 is ideal for fixed rigging applications and is also available in 316 grade but stocked only in 3 and 4mm.

7x19 is the most common and versatile construction of stainless steel wire rope. It consists of 7 strands each with 19 wires and is the most flexible and the easiest construction to work with particularly where the rope needs to turn corners, change directions or where ferrule secured thimble eyes and wire rope grips are used. 7x19 can be used in either fixed rigging or for limited working rope applications such as on a boat winch.

7x7 consists of 7 strands each with 7 wires and is not as flexible as 7x19. 7x7 is an excellent choice for fixed rigging applications such as balustrading and safety barrier rails. Although 7x7 is stiffer than 7x19 it is still capable of limited angles and can be used with thimble eyes or swage fittings. 7x7 has very limited applications as a running or working rope.

1x19 consists of a single strand with 19 wires. 1 x 19 is very stiff and is suitable for fixed "straight line" rigging only such as mast stays, guy ropes and structural applications. It cannot be used with thimble eyes and is best utilised and looks very effective with machine swaged end fittings.



## Product Specifications

Name	ITEM #	MBL (kg)	Mass (kg/m)
S/S Wire Rope 1.6mm 7X7 Gr316	17694	153	0.0108
S/S Wire Rope 2mm 7X19 Gr316	10226	230	0.0167
S/S Wire Rope 2mm 7X7 Gr316	14851	250	0.0166
S/S Wire Rope 3mm 7X19 Gr316	17732	540	0.0363
S/S Wire Rope 3mm 1X19 Gr316	12647	760	0.0459
S/S Wire Rope 3mm 7X7 Gr316	10109	760	0.0371
S/S Wire Rope 4mm 7X7 Gr316	18721	920	0.0682
S/S Wire Rope 4mm 7X19 Gr316	18178	968	0.0628
S/S Wire Rope 4mm 7X19 Gr304	19027	1089	0.065
S/S Wire Rope 4mm 1X19 Gr316	11372	1331	0.082
S/S Wire Rope 5mm 7X19 Gr316	18851	1619	0.098
S/S Wire Rope 5mm 7X19 Gr304	15420	1820	0.1025
S/S Wire Rope 6mm 7X19 Gr316	11961	1910	0.1464



S/S Wire Rope 6mm 7X19 Gr304	19063	2480	0.1464
S/S Wire Rope 8mm 7X19 Gr316	19164	3400	0.2561
S/S Wire Rope 10mm 7X19 sZ Gr316	13911	5250	0.3924
S/S Wire Rope 12mm 7X19 Gr316	11726	8208	0.5644

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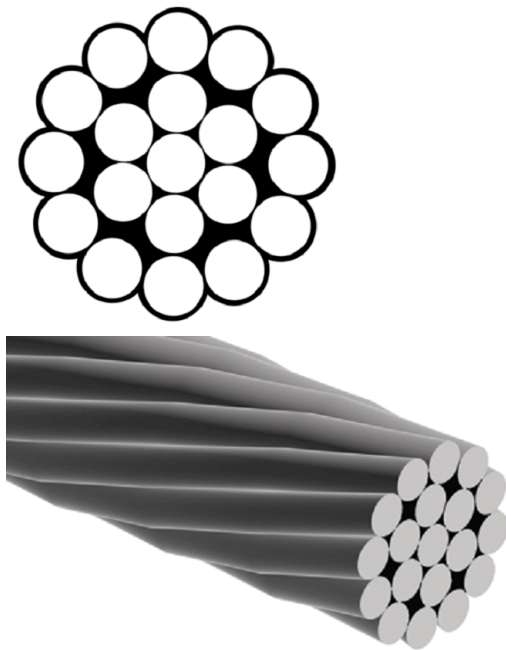
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## Galvanised Strand

Galvanised Strand is commonly used for guys on communication towers, broadcasting towers, power poles and as load carrying members in building structures.

Galvanised Strand is less flexible than wire rope, it is stronger and has a higher modulus of elasticity. It can also be furnished with a Class A galvanised finish.



## Product Specifications

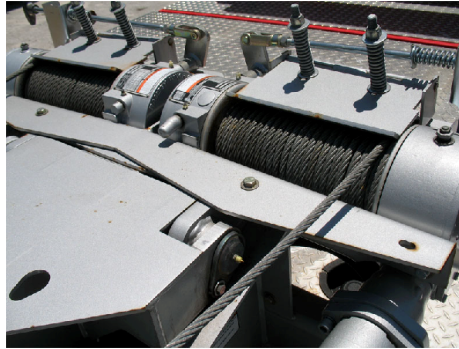
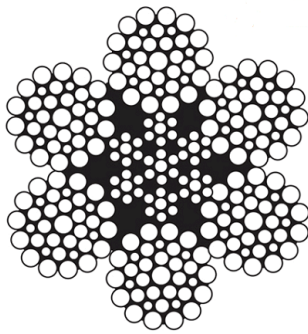
<b>Name</b>	<b>ITEM #</b>	<b>MBL (kN)</b>	<b>Mass (kg/m)</b>
Strand 10mm 1X19 B Gr1570	18094	88	0.504
Strand 12mm 1X19 B Gr1570	12172	126	0.726
Strand 14mm 1X19 B Gr1570	16157	172	0.988
Strand 16mm 1X19 B Gr1570	15896	210	1.29
Strand 18mm 1X19 B Gr1570	15732	265	1.63
Strand 20mm 1X19 B Gr1570	13421	368	2.12
Strand 22mm 1X19 B Gr1570	13322	442	2.55
Strand 24mm 1X19 B Gr1570	16918	518	3.99



## General Purpose Wire Ropes

Nobles stock 6x36 IWRC Galvanised 1960 Grade wire ropes for all general purpose applications. The 6x36 construction provides an excellent balance of flexibility and durability. Likewise the 1960 grade tensile ensures high breaking loads but a very good balance of strength and fatigue resistance for the longest possible service life.

Nobles 6x36 wire ropes are manufactured in accordance with Australian Standard.



## Product Specifications

Name	ITEM #	MBL (kN)	Mass (kg/m)
Wire Rope 8mm 6x36 IWRC 1960 B sZ	21519	44.7	0.262
Wire Rope 9mm 6x36 IWRC 1960 B sZ	20435	56.5	0.331
Wire rope 10mm 6x36 sZ IWRC B 1960	21840	69.8	0.409
Wire rope 11mm 6x36 IWRC B 1960	21841	84.4	0.495
Wire rope 12mm 6x36 IWRC B 1960	21843	100	0.589
Wire rope 13mm 6x36 IWRC B 1960	21845	118	0.691
Wire rope 14mm 6x36 IWRC B 1960	21847	137	0.802
Wire rope 16mm 6x36 IWRC B 1960	21849	179	1.05
Wire rope 18mm 6x36 IWRC B 1960	21851	226	1.33
Wire rope 20mm 6x36 IWRC B 1960	21853	279	1.64
Wire Rope 22mm 6X36 IWRC sZ B 1960	14269	338	1.98
Wire Rope 24mm 6X36 IWRC sZ B 1960	11050	402	2.36
Wire Rope 26mm 6X36 IWRC sZ B 1960	11047	472	2.76

Wire Rope 28mm 6X36 IWRC sZ B 1960	16919	547	3.21
Wire Rope 30mm 6x36 IWRC RHOL B 1960, A2 Lubrication	22404	628	3.68
Wire rope 32mm 6x36 IWRC B 1960	21864	715	4.19
Wire rope 36mm 6x36 IWRC sZ B 1960	21865	904	5.3
Wire rope 40mm 6x36 IWRC B 1960	21867	1120	6.54
Wire rope 44mm 6x36 IWRC B 1960	21869	1350	7.92
Wire rope 48mm 6x36 IWRC B 1960	21870	1610	9.42
Wire rope 52mm 6x36 IWRC B 1960	21871	1890	11.1

Uncontrolled version printed 07-Mar-2018 .See [www.nobles.com.au](http://www.nobles.com.au) for latest up-to-date product information.

## 1.5 Wire Rope General Information





# General Information

## WIRE ROPE

A. Noble & Son Ltd. has been stocking and distributing wire rope almost since the inception of the company in 1911.

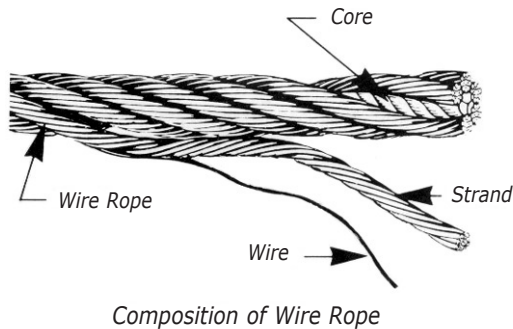
Apart from the distribution of wire rope Nobles personnel can supply guidance on correct usage and selection of wire rope. Nobles branches throughout Australia have swaging presses for terminating wire rope and NATA accredited tensile testing laboratories. The testing laboratories can be used for destruction testing and proof loading of wire ropes and wire rope assemblies.

A. Noble & Son Ltd. represents a range of wire rope manufacturers from all over the world who each have their own specialities in mine winding, crane and general purpose ropes.

### Description, Size & Construction

A wire rope is made up of the basic components illustrated. The terms used to describe these component parts should be strictly adhered to, particularly when reporting on the conditions of ropes.

Describing wires as strands and strands as wire can be grossly misleading. For example, a report that a rope has a broken strand in most applications calls for immediate discarding of the rope, and subsequent cessation of operation, while a report that a rope has a broken wire in it should call for early inspection but seldom for discarding the rope.

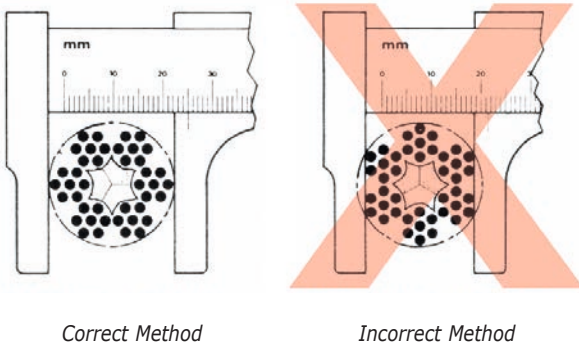


### Wire Rope Description

The properties of a wire rope are derived from its size, construction, quality, lay and type of core.

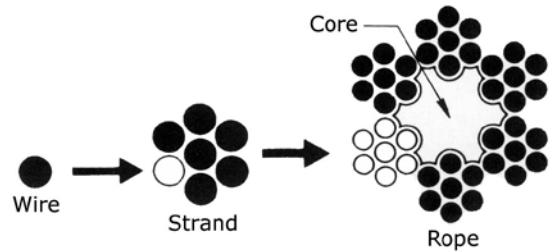
### Size

Ropes are referred to by a diameter size. The correct way to measure wire rope is shown below.



### Construction

The main components of a wire rope are shown below.



In the above example, each individual wire is arranged around a central wire to form a 7-wire strand. Six of these strands are formed around a central core to make a wire rope. The rope is specified as 6x7 (6/1) – i.e. six strands each of seven wires.

The size and number of wires in each strand, as well as the size and number of strands in the rope greatly affect the characteristics of the rope. In general, a large number of small-size wires and strands produce a flexible rope with good resistance to bending fatigue. The rope construction is also important for tensile loading (static, live or shock), abrasive wear, crushing, corrosion and rotation.



*Equal Laid Rope*



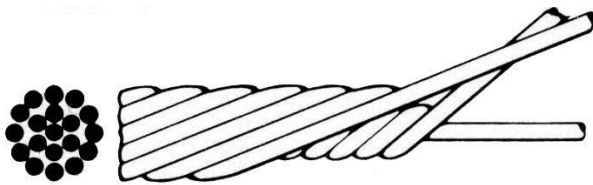
*Cross Laid Rope*



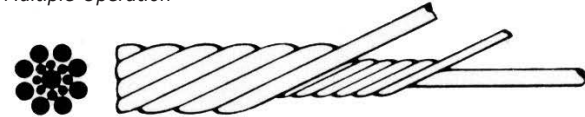


# General Information

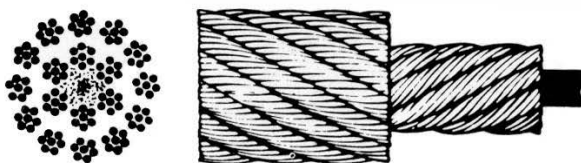
## WIRE ROPE



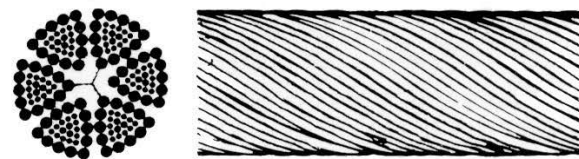
Multiple Operation



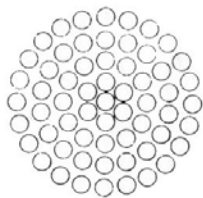
Single Operation



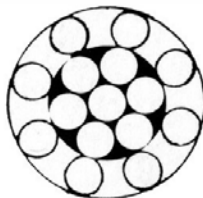
Rotation Resistant



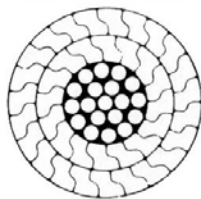
Triangular Strand



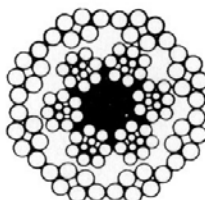
Galvanised Strand



Half Locked Coil



Full Locked Coil



Non-Rotating Mining

**Multiple Operation:** Individual strands are composed of successive layers of wire laid up at different lay lengths. This results in a cross laid rope.

This type of construction is now confined to a limited range of products such as ropes below 8mm diameter, and large sling and static ropes.

**Single Operation:** All wires in the strand are laid up in the one manufacturing operation. This type of rope is standard production, providing an equal laid rope that eliminates internal cross-mating and forms a compact strand of high metallic content. There are three main types: 6x9/9/1, 6x25 FW and 6x36 SW.

**Rotation Resistant:** The conventional rotation resistant wire rope is composed of a number of strands that are laid up in opposite directions to produce a non-rotating effect.

The 4 strand Mono Track is a complete departure from this convention and is created through theoretical analyses of the working torques.

**Triangular Strand:** The wires are specially formed to produce a strand with a triangular section – this type of rope is only produced in Lang's lay. This construction has improved wear and crush resistance and has wide application in winding and haulage systems.

**Galvanised Strand:** These are single strands of concentric layers of wires, some of which are cross laid to produce a non-rotating result.

**Half Locked Coil:** A strand with the outer layer composed of alternate shaped and round wires covering one or two layers of round wires laid in the opposite direction.

**Full Locked Coil:** A strand used as a rope and composed of one or two layers of Z-shaped wires laid over layers of half lock coil and/or layers of round wires.

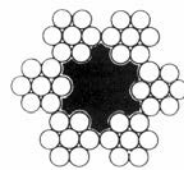
**Rotation Resistant Mining Ropes:** A rope composed of flattened strands of six or eight wires contra laid over a triangular strand rope to produce a rotation resistant result.

### Cores & Wire Tensile

A number of core types are available and each gives specific properties to the rope:

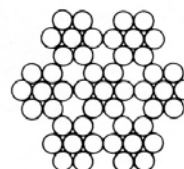
1. Fibre Core (FC) – sisal or polypropylene.
2. Wire Strand Core (WSC) – strand usually of the same construction as the outer strands.
3. Independent Wire Rope Core (IWRC) – a wire rope usually of 6x7 (6/1)/1x7(6/1) construction.

#### Fibre Core (FC) in 6x7 rope



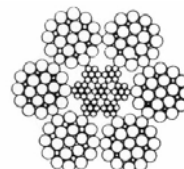
A fibre core, generally sisal, provides a resilient foundation for the strands in the rope structure. Fibre cores are used for ropes that are not subjected to heavy loading and where flexibility in handling is required. Fibre cores are inadequate where wire rope is subjected to heavy loading, prolonged to outdoor exposure and crushing on small drums and sheaves.

#### Wire Strand Core (WSC) in 6x7 Rope



These cores are used chiefly for standing ropes (guys or rigging), and offer higher tensile strength and, owing to the larger wires in the core, greater resistance to corrosion failure.

#### Independent Wire Rope Core (IWRC) in 6x25 FW Rope



In many instances it is recommended to use a wire rope with an independent wire rope core (I.W.R.C). Such a core is usually made up of 6 strands of 7 wires each plus centre strand.



# General Information

## WIRE ROPE

### The independent wire rope core provides:

1. Permanent support and uniform spacing of the strands laid around it; it is not compressible and has greater wear resistance than fibre core.
2. Permanent elastic stretch of the wire rope over a longer period of time.
3. Increased resistance to deterioration and deformation.
4. Delay of internal corrosion; the lubricant is not squeezed out of the core.
5. It increases the actual breaking load of the rope by at least 8% in the case of 6-strand ropes and about 25% in the case of 8-strand ropes.
6. Better performance for operating in very high temperatures.

An independent wire rope core increases the weight of a 6-strand rope by about 10%, and that of an 8-strand rope by approx. 20%.

Although a new rope with I.W.R.C. may be somewhat less flexible than a new rope with fibre core, it retains its relative flexibility whereas a rope with fibre core gradually loses its flexibility during use. Having better resistance to deterioration and deformation, a rope with I.W.R.C. is less susceptible to damage when used on small sheaves and drums than a rope with fibre core, it will also last longer before deterioration and deformation set in when wound on a drum in multiple layers.

### Tensile Strength Grades

Wire ropes are usually supplied in the following tensile ranges:

Rope Grade	Range of wire tensile strength grades N/mm <sup>2</sup>
1570	1370 to 1770
1770	1570 to 1960
1960	1770 to 2160
2160	1960 to 2160

### Rope Grade Equivalents

Rope Grade Designation	Equivalent Rope Grade
IPS	1770
EIPS	1960
EEIPS	2160

With the increasing use of heavy-duty and more compact equipment (e.g. power winches on mobile cranes and mine winding) there is a gradual upward trend in the required rope wire tensile range. However, as factors other than strength influence the life of wire rope, the specific application must be kept in mind when tensile strength of wire is selected.

### Surface Finish

The most common are:

Galvanised wire rope - Zinc coated Class B is denoted with B (formerly G).

Galvanised wire rope - Zinc coated Class A is denoted with A (formerly G Class A).

Uncoated or Bright wire rope (Black) - is denoted with U (formerly B).

### Preforming, Postforming & Lay

#### Preforming

A preformed rope is one in which the component strands are shaped to their final helical form before being laid into the rope.

Preforming can be applied to both Ordinary lay and Lang's lay ropes and, unless specifically ordered otherwise, all standard ropes are supplied preformed.

The advantages of preforming are mainly:

1. Reduction of internal stresses in the rope. This makes the rope easier to handle, install, reduces its tendency to kink and gives better spooling onto drums.
2. Greatly improved resistance to bending fatigue particularly in operation over small drums and sheaves.
3. Greater stability and better resistance to shock loading and abrasion.
4. Improved rope life due to the better equalisation of loading between strands in the rope and reduction of internal stresses in the rope.
5. Greater safety in handling of ropes as broken wire ends do not protrude. This factor also reduces wear on equipment in contact with the rope.

#### Postforming

Postforming is a manufacturing process applied to ropes to minimise stretch in service. It reduces the stretch caused by "bedding-in" the wires and strands onto their respective cores. In addition to controlling stretch, postforming produces results closely related to those achieved by preforming.

Postforming is particularly useful in overcoming stretch in long lengths of rope and where take-up adjustment is restricted. It is commonly applied to ropes used in aerial ropeways, guying, chairlifts and control cables.

#### Lay

This refers to the way the wires in the strands, and the strands in the rope are formed into the completed rope. The wire strands are essentially laid up in a planetary motion with controlled twist being imparted to produce a tightly formed rope.

The term "lay" is used in three ways:

1. To describe the direction in which the strands are laid in the rope, right or left. In a Right Hand lay strands are laid around the rope core in a clockwise direction - see illustration. In a Left Hand lay, the strands are laid anti-clockwise - see illustration. Steel Wire Ropes are conventionally produced Right Hand lay unless special circumstances require Left Hand lay.
2. To describe the direction in which the wires are stranded in relation to the direction of the strands in the completed rope, e.g. Ordinary lay or Lang's lay.

Ordinary lay means the wires in a strand are laid in a direction opposite to the direction in which the strands are laid in the final rope.

Lang's lay is the reverse of Ordinary lay. That is, the wires are laid in the same direction as the strands in the rope.

Lang's lay ropes have superior properties in resistance to wear, abrasion, fatigue and scuffing. This is illustrated on the following page, where it can be seen that wear on an outer wire is distributed over a far greater area than in Ordinary lay.

3. "Lay" is also a measure of the pitch of a strand in a rope.



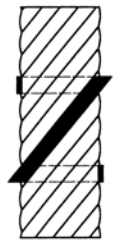
# General Information

## WIRE ROPE

### Lay Directions & Types

Lay direction of strands for stranded ropes are right (z) or left (s) and correspond to the direction of lay of the outer wires in relation to the longitudinal axis of the strand.

Lay direction of ropes are right (Z) or left (S) and correspond to the direction of lay of the outer wires in a spiral rope, the outer strands in a stranded rope or the unit ropes in a cable-laid rope in relation to the longitudinal axis of the rope.



z (right lay)



s (left lay)



Ordinary lay

Lang's lay

RHOL/RHRL (sZ)

LHOL/LHRL (zS)

RHLL (zZ)

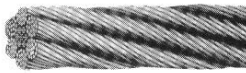
LHLL (sS)

**Note:** The first letter of the symbol denotes strand direction and the second letter denotes rope direction.

Right hand ordinary lay (sZ)



Right hand lang's lay (zZ)



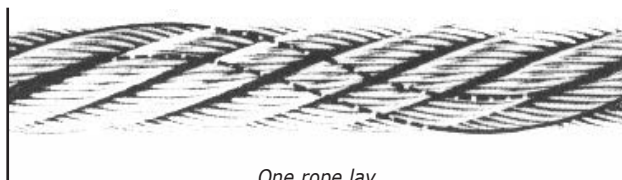
Left hand ordinary lay (zS)



Left hand lang's lay (sS)



Right hand alternate lay (aZ)



One rope lay

**Characteristics of Lay:** The direction of rope lay does not affect the Breaking Force of a rope. However, the combination of strand lay and rope lay will greatly affect the rope characteristics and this factor must be taken into consideration when choosing a rope. Although the lay length can slightly affect rope behaviour the dominant aspect that influences performance is the direction of lay and whether it is Lang's lay or Ordinary lay. For example, the importance of rope lay is evident in a four-part highlift grab where rotation of the grab is prevented by the use of alternate right-hand and left-hand ropes.

### Lubrication, Specifications, Testing & Plastic Coating

#### Lubrication

When a rope is operated over a drum or sheave, the strands and wires move relative to one another. To reduce the resultant friction within the rope as well as the friction between the rope and drum or sheave, ropes are lubricated in manufacture. In addition this lubrication also retards corrosion and inhibits possible rotting of the fibre core. In special applications a combination of lubricants may be called for, e.g., the core and inner wires of the strands may be heavily lubricated while the lighter lubrication may be applied to outer wires and strands.

Wire rope cores are normally heavily lubricated irrespective of the outer strand lubrication.

#### Specifications

All standard ropes are produced to generally comply with the requirements of Australian Standards. However some of our more technically advanced wire ropes have special characteristics required to provide superior performance.

#### Testing & Inspection of Wire Ropes

Nobles can offer special services for rope users to assist in their inspection of used ropes. Our personnel have in many cases had a lifetime in the industry during which considerable experience has been gained.

The NATA accredited tensile laboratories in the various Nobles branches throughout Australia can provide tensile destruction testing services, while the company is also accredited by NATA to carry out non-destructive testing on wire ropes in situ.

#### Plastic Coated Wire Ropes

Plastic coatings are extruded onto a range of rope and stranded products for applications requiring a high resistance to corrosion. Plastic coated ropes are available in the following rope size and construction range:

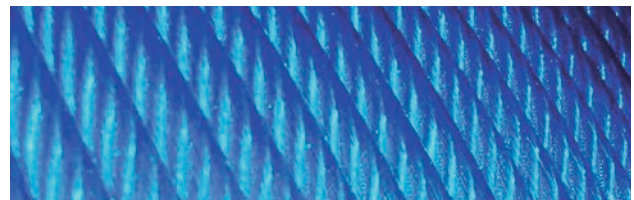
6x7 and 7x7 up to 8mm galvanised

6x19 and 7x19 up to 12mm galvanised

6x24 up to 12mm galvanised

Typical applications are rigging lines, handrails, steering lines and holding lines in the shipping, pearling and fishing industries.

Plastic coated strands are also available in PVC and black polyethylene.



Standard Blue PVC Coating on 6 x 19 FC B 1570 Wire Rope



# General Information

## WIRE ROPE

### Ordering

The size, grade and construction of a rope must match the specific application and design factors.

### Rope Length

Wire rope is manufactured to length tolerances as follows;

Up to 400m = +5% - 0%  
400 to 1000m = +20m  
Over 1000m = +2% - 0%

When a closer length is required, this should be specified in the order. In calculating rope length requirements, it is advisable to consider the following practical points for economy in operation:

1. In most cases, mining regulations require a test length be cut at specified periods. Sufficient extra length to cater for such tests over the expected service life of the rope should be added to the necessary operating rope length, plus a minimum of 2 1/2 drum turns for anchorage.
2. It is also advisable to make allowance for "cropping" in service as a consequence of wear or accidental damage at the capel end.
3. In many rope applications, wear and other deterioration are concentrated in spots along the length of the rope. It is often possible to gain economies in the overall life of the rope by providing additional length to enable feeding through of the new rope from the drum to spread the area of wear. This practice is regularly used to advantage on cable-operated earthmoving equipment and oil-well drilling rigs.
4. Short lengths of special rope constructions, if ordered in single units, can be costly to produce. Consideration of the number of such ropes in use and their probable service life can often make it more economical to order several such ropes at one time. As a rule, this helps to expedite production and lessens the possibility of delays in supply.

On existing equipment the rope size is generally fixed by the grooving of the sheaves and drums. Larger ropes should never be used without modification of drum and sheave grooving to suit the new rope. It should be remembered that ropes 8mm and above are made to a diameter tolerance of minus 0% to plus 5% with the exception of 6x24 construction, which has a tolerance of plus 7%.

### Construction

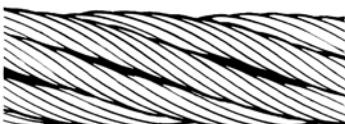
The construction of a rope for any given application should be suited to the equipment and to the conditions under which it will operate. It is important to nominate the construction when ordering. For example, the rope illustrated is ordered as 6x25 Filler Wire.

### Rope Grade

The minimum tensile strength of the wire is expressed in megapascals.

### Lay of Rope

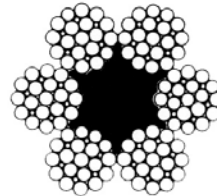
Lay affects behaviour and operating life of a wire rope. It is important therefore to quote (a) the direction of lay, and (b) the type of lay and details of the rope application and operating conditions. The illustration shows a right hand lang's lay (zZ) or RHLL rope. Ropes are normally supplied right-hand lay.



Right Hand Lang's Lay

### Rope Core

The type of rope core must be specified because of the significant differences in properties of a wire rope core and fibre core.



6 x 25 FW Fibre Core

### Ordering for Special Applications

To obtain the best rope recommended for particular equipment and operating conditions, information should be supplied on loading, sheave and drum diameters, speed of operation, corrosive conditions and fleet angles etc. A simple sketch of the rope rigging is a convenient means of showing this type of information.

All orders should contain information on the above factors.

When purchasers are not sure of the exact requirements the following particulars should be submitted:-

- (a) Length and size.
- (b) Load exclusive of mass of the rope.
- (c) Dimensions of drums and sheave.
- (d) Corrosive conditions.
- (e) Sketch of the application.

### Special aspects of rope supply may be necessary

The following check list is suggested:-

- (a) Special length considerations such as minimum length, exact length.
- (b) Special diameter tolerance.
- (c) Rope end preparation.
- (d) End attachments to inside or outside end.
- (e) Stretch considerations.
- (f) Special lubricant type and amount.
- (g) Special reel dimensions, strength, shaft sizes, anchorage details and lagging.
- (h) Despatch instructions.

### EXAMPLE

A typical order for wire rope would read:

"500m 16mm 6x9/9/1 A, B or U 1770 Grade RHLL (zZ) IWRC."

### Abbreviations, Prestretching & Seizing

#### Abbreviations

The following abbreviations have been standardised for ordering and identification purposes.

#### Wire Qualities

1570 MPa

1770 MPa

1960 MPa

I.P.S. - Improved Plough Steel

E.I.P.S. - Extra Improved Plough Steel



# General Information

## WIRE ROPE

### Constructions & Lays

RHOL	Right Hand Ordinary Lay (sZ)
LHOL	Left Hand Ordinary Lay (zS)
RHLL	Right Hand Lang's Lay (zZ)
LHLL	Left Hand Lang's Lay (sS)
RHAL	Right Hand Alternate Lay (aZ)
Pref	Preformed
Post	Postformed
IWRC	Independent Wire Rope Core
WSC	Wire Strand Core
FC	Fibre Core
FW	Filler Wire Strand Construction
TS	Triangular Strand Construction
W	Warrington Strand Construction
S	Seale Strand Construction
SW	Seale Warrington Construction
SF	Seale Filler Construction
D or d	Diameter (in millimetres)
FS	Flattened Strand
HLC	Half Locked Coil
FLC	Full Locked Coil

### Prestretching

Is the loading of a rope or strand from 33.3% to 50% of its breaking load to remove constructional stretch, and this allows for the more accurate setting of lengths for guying and suspension cables.

The initial stretch cannot be accurately determined by theoretical means and will continue to take place until it has been completely removed.

After this initial stretch (or constructional stretch) has been removed the strand will have a truly elastic measure where elongation is proportional to applied load.

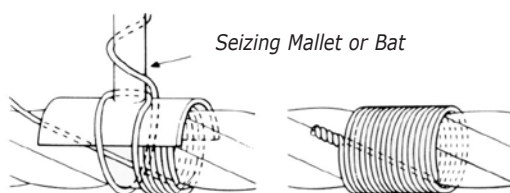
### Seizing

Either of the following methods of seizing will ensure that the rope will later perform its job satisfactorily.

#### Long Seizing (for ropes over 26mm diameter)

1. Place one end of seizing wire in the valley between strands.
2. Take the long end of the wire and turn at right angles to itself and wind back over itself and the rope in a close tight seizing of the required length.
3. The amount of seizing should not be less than 6 to 8 times the rope diameter.
4. Twist the two ends of the wire together. Alternate tightening and twisting of the ends will draw the seizing up tight.
5. Cut the end of the twisted wires and knock down into a valley between two strands.

#### Long Seizing

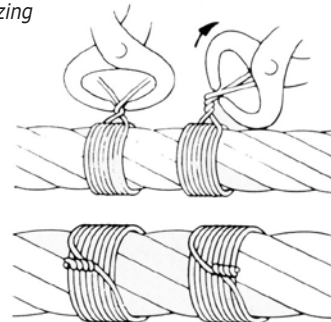


The above method is best applied using a seizing mallet or bat.

#### Short Seizing (for ropes below 26mm diameter)

1. Wrap the seizing wire around the rope eight or ten turns.
2. Twist the two ends of the seizing wire together approximately at the centre position of the seizing. Alternate tightening and twisting of the ends will draw the seizing up tight.
3. Cut the end of the twisted wires and knock down into a valley between strands.

#### Short Seizing



The number of seizings required depends on the type and diameter of the rope. The following minimum number of seizings are recommended:-

Preformed or Postformed ordinary lay – 1 seizing.

Lang's lay rope with wire rope core and rotation resistant ropes – 2 seizings.

### Seizing Wire

Both soft annealed single wire and stranded seizing wires are used in the seizing of steel wire ropes. Suitable sizes are listed below:-

#### List of Seizings Recommended For Standard Ropes

Rope Diameter (mm)	7 wire seizing strand	Single seizing wire
Up to 14		0.90
16 – 26		1.25
28 – 38	7/0.90	2.00
Over 38	7/1.25	2.75

### Transport, Storage & Handling

#### Transporting

Ropes are supplied on reels or in coil form. When transporting, care must be taken not to damage rope by contact with other goods. Reels and coils should be lifted rather than dropped, tipped or rolled, to avoid damage.

Ropes should be uncovered as soon as they are received and checked for possible transit damage.

#### Storage

Ropes, whether on reel or in coils, should be stored on blocks off the floor to prevent sweating and corrosion and under cover in dry conditions free from possible attack by corrosive agents, such as milldust, sulphur or acid fumes.



# General Information

## WIRE ROPE

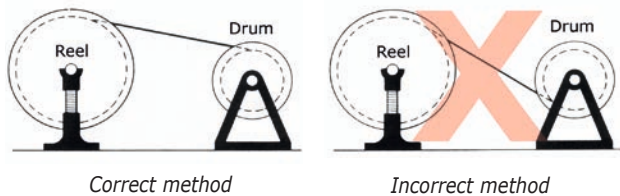
If ropes are to be stored for any length of time in warm or hot conditions likely to cause the lubricant to drain to the lower side of the reel, the reels should be mounted on a horizontal shaft and turned over periodically to maintain uniform lubrication of the rope. Additional lubrication may be necessary.

Removed ropes awaiting further use, should be thoroughly cleaned, inspected, lubricated and stored under the same conditions as new ropes.

### Handling

Incorrect handling of rope from reels and coils can result in springing of wires and strands and kinking of the rope. This type of damage can seldom be entirely corrected and can greatly reduce the effective life of the rope.

The drawings show correct and incorrect methods of reeling a rope from the transport reel onto a drum or another reel. The transport reel should be firmly mounted and braked to prevent overrunning and give tight rewinding. A suitable stand for the reel is also shown.

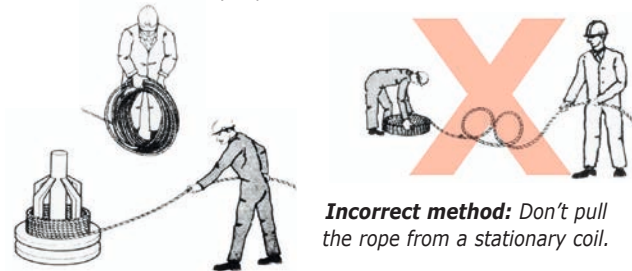


### Methods of removing rope from reels & coils

Turntables, preferably mounted on the floor, may be used for unwinding ropes from reels stored on their sides. Care must be taken to brake such turntables, as over-running could cause the rope to slacken, fall off and foul under the turntable.

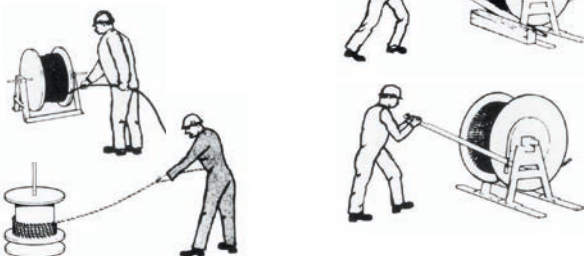
If a coil is too large to be handled manually it should be mounted on a turntable or suspended by a spindle from a swivel crane hook.

When coiling ropes down by hand on the floor, an occasional coil wound "underhand" relieves torque and provides a more easily handled coil. Right Hand lay ropes should be coiled down clockwise, Left Hand lay ropes anti-clockwise.



**Incorrect method:** Don't pull the rope from a stationary coil.

**Correct methods of taking ropes from coils:** Roll the coil along the ground or use a turntable.



**Correct methods of taking ropes from reels:** When a large reel is used, it is recommended that a plank is used as a brake against the reel flange or on the shaft or side plate.

## WARNING

- When releasing rope from coils or reels, care must be taken to retard the violent release of the rope end which could cause damage, serious injury or death.

### Installation

#### Rope Equipment Checking

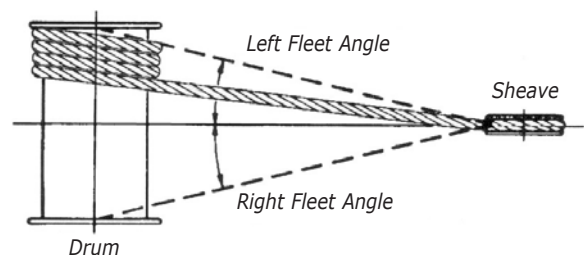
Improved rope performance can be obtained by paying attention to the following areas:

- Sheaves should be grooved to the nominal rope diameter plus an allowance of 7% to allow for rope manufacturing tolerances and should be re-machined when worn to nominal diameter plus 3%. Sheaves must also be free from score marks, run freely and be true.
- Guides and rollers must be free from undersized grooving and broken flanges, and should run free and true.
- Drum grooves should be checked for size and riser plates checked for effectiveness.
- Displaced or damaged cheek plates in rope blocks or safety guards should be repaired.
- Grabbing clutches and brakes should be repaired and adjusted to obviate impact loads on the rope.
- End fittings, such as wedges, sockets and drums anchorages, should be inspected for excessive wear.

**The fleet angle** has an important bearing on the winding of a rope from sheave to drum, particularly at high operation speeds. If winding is to take place smoothly, the fleet angles on both sides of the drum will have to be kept within acceptable limits.

Excessive fleet angles can result in considerable abrasive damage to both sheave flanges and rope and considerably reduce the life of the rope and the equipment.

Fleet angles normally range to a maximum of 1.5° for plain drums and to a maximum of 2.5° for grooved drums. Smaller angles are required for high speed haulage such as mine windings. Unless the head or guide sheave is centred with respect to the drum, there will be different values for the left and the right fleet angles.



### Rope End Preparation

Normally wire ropes are delivered with seized ends. As a rule, no further preparation is necessary, but in some cases where ropes must be reeved through restricted openings, such as drum anchorages and blocks systems, the rope can be supplied with welded tapered ends or with links welded on the ends. The latter enables the new rope to be installed by attaching it either to the old rope or a tow rope and drawing onto the equipment.

### Tensioning Rope

Wire rope for multi-layer drums must be installed under tension. It is imperative that the bottom layer is tight with the exact number of turns on the drum.



# General Information

## WIRE ROPE

### Wire Rope Life

The main factors, which affect rope life are:

#### 1. Basic design of equipment or installation:

Sheave size, drum design and drum diameter can directly affect wire rope life. For example, doubling the sheave size can produce up to four times the rope life. The minimum ratios in the following table should be adhered to:-

#### Recommended Minimum Ratio of Drum & Sheave Diameter to Rope Diameter

Rope Construction	Ratio
6 x 7	43
6 x 19S (9/9.1)	32
6 x 21FW (10/5 + 5F/1)	30
6 x 19W (6 & 6/6/1)	30
6 x 25FW (12/6 + 6F/1)	23
6 x 36SW (14/7 & 7/7/1)	22
6 x 26WF (7 & 7/7/4/1)	22
6 x 24 (15/9/F)	22
6 x 29FW (14/7 + 7F/1)	22
6 x 41SW (16/8/8 & 8/8/1)	21
6 x 37 (18/12/6/1)	21
19 x 7	23
35 x 7	20
4 x 39 Mono Track	20

For Casar Ropes refer to A. Noble & Son Ltd.

#### 2. Operating Environment:

**Corrosion** – when corrosive conditions exist, regular rope inspection, particularly of the IWRC, is essential. The effects of corrosion can be partly offset by the use of galvanised wire rope.

**Temperature** – excessively high operating temperatures can lead to deterioration of the wire rope core, and thereby cause rope fatigue.

#### 3. Rope Maintenance:

**End for ending and cropping** – in certain applications, e.g., drag ropes, it is possible to “end for end” the rope. This will give longer rope life due to the wear points being re-located. If additional rope can be accommodated on the drum, then progressive cutting back (cropping) will bring “new” rope into the system, and will re-locate wear points.

**Treatment of broken wires** – broken wires affecting the life of adjacent wires should be removed.

**Discard practices** – clear policies regarding discard should be formulated. Rope Maintenance Schedules, based on experience, should be drawn up to provide periodic inspections and removal cycles for each rope as well as inspections of individual components such as the sheaves. Regular maintenance ensures optimum rope life, minimises down time of plant and equipment and increases the efficiency of the operation.

#### Broken Wires

General purpose ropes, crane ropes and hoist ropes should be discarded whenever any of the types of degradation exceed the limits given in the Table below. However, the rope life may be ended before these limits are reached.

The table below allows for internal wire breaks and is valid for all constructions of rope. In 6-strand and in 8-strand ropes, wire breaks occur principally at the external surface. This does not apply to wire ropes having a number of layers of strands (typically multistrand constructions), where the majority of wire breaks occur internally and are therefore non-visible fractures.

### Limit of Degradation for Discard of General Purpose Lifting Ropes, Crane Ropes & Hoist Ropes (see Notes 1 & 2)

Type of degradation	Construction (see Note 3)	Limit of degradation for discard (see Note 4)	
		Maximum allowable number of broken wires over a length of 6 times the rope's diameter	Maximum allowable number of broken wires over a length of 30 times the rope's diameter
Broken wires	6 x 19 (12/6/1) 6 x 19 S (9/9/1) 6 x 26 SW (10/5 and 5/5/1) 6 x 25 FW (12/6 and 6/1) 6 x 29 FW (14/7/7/1) 6 x 24 (15/9/F) 8 x 19 S (9/9/1) 8 x 25 FW (12/6 and 6/1) 6 x 36 SW (14/7 and 7/7/1) 6 x 37 (18/12/6/1) 6 x 41 SW (16/8 and 8/8/1) 18 x 7 NR 34 x 7 NR 4 x 48	5 3 5 5 7 5 5 6 7 10 9 1 2 2	10 6 10 10 14 10 10 13 14 19 18 2 4 4
Wear	All types	Outer wires are worn more than one third of their diameter	
Loss of area	All types	The loss of metallic area due to visible combined wire wear and broken or cracked wires exceeds 10%	
Corrosion	All types	Corrosion is marked by noticeable pitting or loosening of outer wires	

#### NOTES:

- The number of wire breaks before discard in the above table is quite high, and if wire breaks are concentrated in one strand, lower levels for discard are appropriate. If more than one third of the outer wires in a strand are broken over a length of six times the rope diameter, the rope shall be discarded.
- Where ropes are used for lifts, AS 1735.2 applies, which is less stringent than the above table. The mining industry frequently requires more stringent discard criteria.
- Rope of Lang's lay construction other than rotation resistant ropes shall have no more than 50% of the above values.
- Number of broken wires alone is not the only factor in discarding a wire rope.

For Casar and 4 x 39 Mono Track wire ropes refer to A. Noble & Son Ltd.





# General Information

## WIRE ROPE

### Care & Maintenance

#### Breaking in

A wire rope may be looked upon as a machine composed of a large number of moving parts. As such it should be broken in as soon as it is installed, by loading it very lightly for a few cycles and then gradually stepping up the load, to enable both wires and strands to 'bed down' into the working positions, with the load distributed as uniformly as possible.

With strand 6 and 8 stranded ropes, the torque can greatly diminish after breaking in by releasing the connection and allowing the torque to run out. This procedure may have to be repeated until the constructional stretch has been worked out of the rope and it has become neutral.

The use of 'spinners' or swivels should be avoided whenever possible. All ropes should be reeled onto winch drums as tightly and uniformly as possible during the initial installation.

#### Inspection

Wire rope is tough and durable, but nonetheless expendable and eventually reaches the end of its safe service life. Rope deterioration becomes noticeable through the presence of broken wires, surface wear, corrosion, wire or strand distortion due to mechanical abuse, or drastic reduction in diameter and lengthening of the lay. Also deterioration can be detected by the use of non-destructive testing techniques. Wire ropes should periodically be inspected for signs of deterioration.

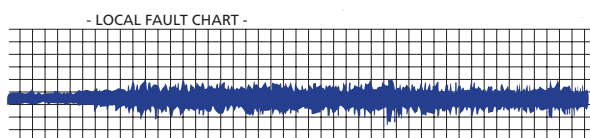
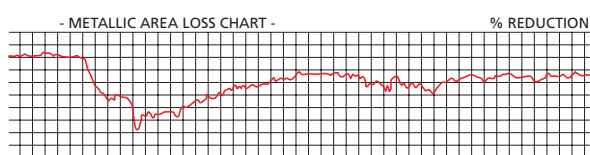
While Statutory Regulations govern the inspection and discarding of certain wire ropes, the same rules cannot be applied to all ropes. The proper frequency and degree of inspection depends largely on the possible risk to personnel and machinery in the event of rope failure. The determination of the point at which a rope should be discarded for reasons of safety requires judgment and experience in rope inspection in addition to knowledge of the performance of previous ropes used in the same application.

Where the Statutory Regulations are laid down for the inspection and discarding of wire ropes and their attachments, wire rope users should become fully acquainted with the regulations and see that they are carried out.

Sufficient records should be kept to provide a reliable history of the ropes under their control. Inspection of both operated and discarded ropes frequently indicates equipment faults that have a large bearing on the service life and safety of the rope. It is therefore essential to inspect the equipment on which the rope is used as well as the rope itself.

#### Non Destructive Testing

This method of inspection of wire ropes has become part of the mining industries standard requirements for over 20 years. An electromagnetic instrument is used to non-destructively examine the rope. It incorporates a sensor head that is able to induce a magnetic field in a section of rope that is located within the instrument. Changes in the metallic field enable a chart to be produced showing changes in metallic cross-sectional area and any wire breaks or other anomalies. Life of costly wire ropes may be extended by this sophisticated method.



### Deterioration

#### Typical examples of wire rope deterioration

1. Mechanical damage due to rope movement over sharp edges whilst under load
2. Localised wear due to abrasion on supporting structure.
3. Narrow path of wire breaks caused by working in a grossly oversized groove or over small support rollers.
4. Severe wear in Lang's Lay, caused by abrasion at cross-over points on multi-layer coiling application.
5. Corrosion of severe degree caused by immersion of rope in water.
6. Typical wire fractures as a result of bend fatigue.
7. Wire fractures at the strand, or core interface, as distinct from 'crown' fractures caused by failure of core support.
8. Typical example of localised wear and deformation created at a previously kinked portion of rope.
9. Multi-strand rope 'bird caged' due to torsional unbalance. Typical of build-up seen at anchorage end of multi-fall crane application.
10. Protrusion of IWRC resulting from shock loading.





# General Information

## WIRE ROPE

### Stretch in Ropes

When load is first applied to a new rope it stretches due to the individual wires settling down. This is referred to as the Initial or Manufacturing Stretch. Subsequently a gradual stretch takes place during the whole of the rope's life; the amount depends on many variables such as length, type of construction, loading and the modulus of elasticity of the particular rope.

To forecast the amount of stretch accurately for a rope under a given set of conditions, calculations must be based on the result of a load/extension test on a sample from the particular rope. However, if the results of such a test are not available, an indication of the increase in length can be obtained from the formula.

$$T = (2W + Lw) \left( \frac{L}{2a E} \right)$$

Where T = Stretch in metres  
 W = Load in kgs  
 L = Length in metres  
 w = Weight of rope in kgs/metre  
 a = Cross sectional area of rope in millimetres<sup>2</sup>  
 E = Modulus of Elasticity, kgs/mm<sup>2</sup>

### Approximate Modulus of Elasticity for New Ropes

6 x 7 FC	96 GPa	(0.0098 x 10 <sup>6</sup> kgs/mm <sup>2</sup> )
7 X 7	117 GPa	(0.0119 x 10 <sup>6</sup> kgs/mm <sup>2</sup> )
6 X 19 FC	89 GPa	(0.0091 x 10 <sup>6</sup> kgs/mm <sup>2</sup> )
6 X 19 IWRC	110 GPa	(0.0112 x 10 <sup>6</sup> kgs/mm <sup>2</sup> )
7 Wire Strand	145 GPa	(0.0148 x 10 <sup>6</sup> kgs/mm <sup>2</sup> )
19 Wire Strand	125 GPa	(0.0127 x 10 <sup>6</sup> kgs/mm <sup>2</sup> )
36 Wire Strand	110 GPa	(0.0012 x 10 <sup>6</sup> kgs/mm <sup>2</sup> )
6 x 36 IWRC	82 GPa	(0.0084 x 10 <sup>6</sup> kgs/mm <sup>2</sup> )
6 x 36 FC	82 GPa	(0.0084 x 10 <sup>6</sup> kgs/mm <sup>2</sup> )
6 x 12/12/ Δ FC	96 GPa	(0.0098 x 10 <sup>6</sup> kgs/mm <sup>2</sup> )
Locked Coil Winding Rope	125 GPa	(0.0127 x 10 <sup>6</sup> kgs/mm <sup>2</sup> )
Locked Coil Guide Rope	138 GPa	(0.0141 x 10 <sup>6</sup> kgs/mm <sup>2</sup> )

For used ropes 20% should be added to these figures.

### Calculation of Cross Sectional Area of Wire Rope

$$A = F \times d^2$$

A = Metallic area of rope with fibre core in mm<sup>2</sup>

F = Compactness factor

d = Nominal diameter of rope in millimetres

For 6 strand rope with IWRC add 15%, with strand core add 20%

For flattened strand rope with IWRC, add 10%

For 8 strand rope with IWRC, add 20%

### Compactness Factor F

Rope Construction	Factor F
6 x 7	0.38
6 x 19/6 x 21	0.395
6 x 25 Filler Wire/6 x 36 Group	0.405
7 Wire Galvanised Guy Strand	0.596
19 Wire Galvanised Guy Strand	0.580



# General Information

## WIRE ROPE

### Tolerances on rope diameter

Nominal Rope Diameter $d$ mm	Tolerance as percentage of nominal diameter	
	Ropes with strands that are exclusively of wire or incorporate solid polymer centres	Ropes with strands that incorporate fibre centres*
$2 \leq d < 4$	+8 -0	-
$4 \leq d < 6$	+7 -0	+9 -0
$6 \leq d < 8$	+6 -0	+8 -0
$\geq 8$	+5 -0	+7 -0

\* For example 6 x 24FC

### Permissible differences between any two diameter measurements

Nominal Rope Diameter $d$ mm	Tolerance as percentage of nominal diameter	
	Ropes with strands that are exclusively of wire or incorporate solid polymer centres	Ropes with strands that incorporate fibre centres*
$2 \leq d < 4$	7	-
$4 \leq d < 6$	6	8
$6 \leq d < 8$	5	7
$\geq 8$	4	6

\* For example 6 x 24FC



# General Information

## WIRE ROPE

The following tables show rope mass in "kg per 100 metres" and breaking force in "kilonewtons" for the various rope groups.

It will be noted that the value varies from group to group since the various constructions contain different steel areas and variable losses are incurred as the result of the stranding of the wires.

Wire quality has been nominated in 1570, 1770 and 1960 grade for the majority of wire ropes, the value 1570, 1770 etc. corresponds to the minimum tensile strength of the wire expressed in megapascals. Marine and General Purpose galvanised ropes have been nominated in 1570 grade and are confined to certain rope constructions. Other 6 strand constructions in galvanised rope should be ordered in 1770 grade.

The breaking forces of rope of tensile grades other than 1770 can be calculated by multiplying the value of 1770 grade by the ratio of the grade number. The grade of 2070 is the preferred high tensile grade for 6 strand ropes but 1960 is preferred for 19x7, 35x7 and most Casar ropes.

All ropes are in millimeter diameter. Only preferred sizes have been included in the tables. Non preferred sizes should be the subject of special inquiry. Special non preferred sizes to suit existing deep mining and large excavator equipment are available although new equipment should use only preferred diameters.

The breaking force unit is the kilonewton, this being the force which, applied to a mass of one kilogram, produces an acceleration of one metre per second. The minimum rope breaking force required will depend on the factor of safety covered by the application and in the case of a single supporting rope where the rope mass is ignored will be equal to the gravitational force multiplied by the factor of safety. Minimum rope breaking force (kN) = Mass (tonnes) per rope part x factor of safety required x 9.81.

**To calculate approximate mass equivalent, at sea level, divide kilonewtons by 9.81**

**Example: 12mm 6 x 7 Fibre Core G1570 grade**

$$= 75 \text{ kN} = \frac{75}{9.81} = 7.65 \text{ tonnes}$$

**For most practical purposes, divide by 10 in lieu of 9.81**

## TYPICAL ROPE RECOMENDATIONS

Applications	Size Range Dia. (mm)	Rope Recommendations	Lay Preformed	Core	Factors of Safety
<b>LOGGING</b>	Log Winch	13 - 28 32 - 36	19S 25FW	RHOL RHOL	Logging Skylines.....3.5
	Log Skidder	13 - 28	19S, 25FW	RHOL	
	Yard Rope	16 - 20	25FW, 29FW	RHOL	
<b>PILING</b>	Pile Driving Hammer	16 - 32	36	RHOL	IWRC FC IWRC, FC
	Drop Hammer	16 - 32	25FW, 36SW, 4x39	RHOL	
	Pile Handling	13 - 24	25FW	RHOL	
<b>SLINGS</b>	Slings - Standard	9 - 32	24, 36SW	RHOL	AS 1666 - 1995.....5.0
	Slings - High Tensile	9 - 28 32 - 104	25FW, 36SW 36SW, 41SW	RHOL RHOL	
				RHOL	
<b>CRANES</b>	Tower - Hoist	20 - 42	Eurolift, 35x7, Powerlift, Starlift	RHOL or RHLL	For safety factors on cranes refer to AS 1418.1:2002
	Tower - Luffing	20 - 42	4x39, Stratoplast, Turboplast	RHLL	
	Trolley Line	13 - 24	25FW, 36SW	RHOL	
	Overhead	6 - 10	19x7, Starlift		
	1 - 3 Falls Overhead	12 - 18	35x7, Eurolift, 4x39	RHOL	
4 Falls or more		Stratoplast, Turboplast	RHOL or RHLL		
Mobile - Hoist	11 - 20	25FW, 36SW, Betalift, Alphalift	RHOL or RHLL	IWRC	
Mobile - Luffing	22 - 32	Eurolift, Starlift, 19x7, 35x7, 4x39	RHOL or RHLL	IWRC	
	13 - 26	Eurolift, Starlift, 19x7, 35x7, 4x39	RHOL or RHLL	IWRC	
<b>GRABS</b>	Grab - Holding	18 - 28	25FW, 36SW, 4x39	RHOL or RHLL	.....5.0
	Closing	18 - 29	Stratoplast, Turboplast	LHOL or LHLL	
<b>WATER DRILLING</b>		14 - 18	24, 4x39	LHOL, RHOL	FC
<b>DRILLING</b>	Diamond	12 - 16	19x7, 4x39	RHOL	FC FC
		16 - 20	35x7, 4x39	RHOL*	
<b>SHIPPING</b>	Mooring	16 - 26	24, 36SW	RHOL	FC FC FC, IWRC FC IWRC
		26 - 40	36SW, 41SW	RHOL	
	Towing	32 - 56	36SW, 41SW	RHOL	
	Loading Gear - Lashing	12 - 32	24	RHOL	
	Rigging	10 - 32	7x7, 7x19	RHOL	
<b>SLIPWAY</b>		16 - 32	24, 36SW	RHOL	FC FC, IWRC
		32 - 56	36SW, 41SW	RHOL	
<b>WINCHES</b>	Trailer - Boat	5 - 8	19, 7x19	RHOL	IWRC, FC IWRC IWRC
		8 - 28	19S, 25FW, 36SW	RHOL	
		32 - 64	25FW, 36SW, 41SW	RHOL	

**Note:** 6 Strand ropes except where otherwise stated.